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ENGINEERING FLIGHT TEST-AH1G HELICOPTER
WITH MODEL 212 TAIL ROTOR. PART I.
LOAD SURVEY

Leslie J. Hepler, et al

Army Aviation Systems Test Activity
Edwards Air Force Base, California

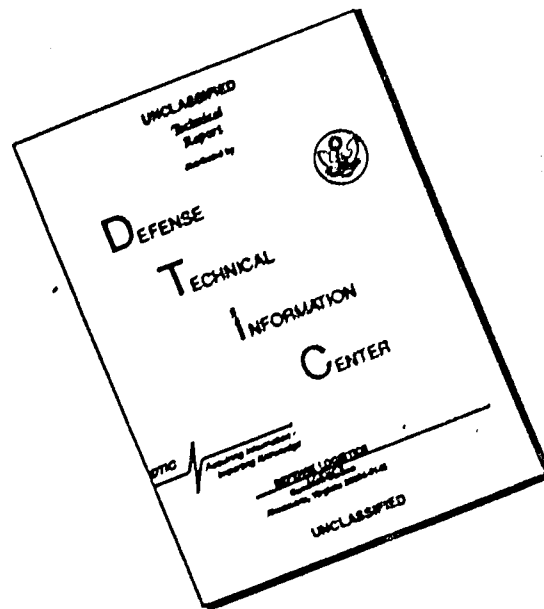
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The United States Army Aviation Systems Test Activity conducted a limited tail boom flight load survey of the AH-1G helicopter equipped with a Model 212 tail rotor. Tests were performed to obtain base-line tail boom load data with a tractor tail rotor installation, then repeated with the Model 212 tail rotor installed on the same helicopter. This installation included changes to the pitch links and pitch control tube to accommodate the Model 212 tail rotor; however, the remaining components of the tail rotor drive system were standard AH-1G items. (continued)		

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20. Abstract

The survey was conducted at Edwards Air Force Base, California, between 19 March and 9 May 1973. Twenty-five productive flight hours were required for these tests: 12 hours with the tractor tail rotor and 13 hours with the Model 212 tail rotor. Test data indicate that the AH-1G helicopter with the Model 212 tail rotor generally exhibited higher mean loads in the tail rotor pitch links (compression), tail boom lateral bending, and tail rotor shaft than with the Model 801 tail rotor. Higher oscillatory loads in tail boom lateral bending and tail rotor shaft parallel bending were also noted. With the Model 801 installation, mean loads were higher in the tail rotor pitch control tube (tension) and oscillatory loads were higher in the tail rotor pitch links.

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INTRODUCTION

BACKGROUND

1. Results of the United States Army Aviation Systems Test Activity (USAASTA) Phase B testing showed that directional control power was inadequate within a large portion of the proposed low-speed in-ground-effect (IGE) maneuver envelope for the AH-1G helicopter (ref 1, app A). Subsequent testing with the tractor tail rotor showed continuing directional control problems and significant flight and gross weight restrictions (ref 2). The USAASTA was directed by the United States Army Aviation Systems Command (AVSCOM) to evaluate the AH-1G helicopter with the Model 212 tail rotor (app B).

TEST OBJECTIVES

2. The objectives of the AH-1G/Model 212 tail rotor evaluation are as follows:
 - a. To conduct a tail boom load survey with the Model 212 tail rotor.
 - b. To conduct a limited performance evaluation of the Model 212 tail rotor.
 - c. To obtain quantitative and qualitative stability and control flight test data on the AH-1G in the Model 212 tail rotor configuration.
 - d. To determine the instrument-flight-rules (IFR) capability of the AH-1G helicopter with the Model 212 tail rotor.
3. This report presents results of the tail boom load survey (para 2a). The remaining test objectives will be reported separately as tests are completed.

DESCRIPTION

4. The test helicopter, AH-1G serial number 71-20985, is a production aircraft with a tractor tail rotor. The helicopter features two-place tandem seating and two-bladed main and tail rotors. A three-axis stability and control augmentation system (SCAS) is provided. The power plant is a Lycoming T53-L-13B rated at 1400 shaft horsepower (shp) at sea-level, static conditions. Installed in the AH-1G, the engine is limited to 1100 shp due to the main transmission torque limit. The maximum gross weight of the AH-1G is 9500 pounds. The Model 212 tail rotor, installed for this evaluation, is a flex-beam rotor which is standard on the Bell Helicopter Company (BHC) Model 212 commercial helicopter. Compared to the tractor tail rotor (Model 801) the Model 212 tail rotor has an increased chord from 8.4 inches to 11.5 inches, and a cambered airfoil blade section. The tail rotor drive system included standard AH-1G components except for the changes

to the pitch links and pitch control tube necessary to accommodate the Model 212 tail rotor. The physical characteristics of the tractor tail rotor and the Model 212 tail rotor are listed in appendix C. The Model 801 tail rotor is more fully described in BHC Engineering Change Proposal AH-1G 350 (ref 3, app A). A more detailed description of the AH-1G helicopter is contained in the operator's manual (ref 4). Photographs of the Model 801 and 212 tail rotor installations are presented in appendix D.

TEST SCOPE

5. The AH-1G/Model 212 tail rotor load survey was conducted to obtain a quantitative comparison of tail boom and tail rotor loads of the tractor tail rotor and the Model 212 tail rotor. Tests were conducted at Edwards Air Force Base, California from 19 March to 9 May 1973. During the loads survey, 34 flights were conducted for a total of 35 flight hours, of which 25 were productive. The two configurations tested were clean (no external stores), and Hog (two XM159C pods on each wing), with dummy rockets installed to achieve the desired gross weight. Test conditions are shown in table 1.

6. The flight restrictions and operating limitations applicable to this evaluation are contained in the operator's manual (ref 4, app A), as modified by the safety-of-flight release (refs 5 and 6).

TEST METHODOLOGY

7. Test maneuvers were based on the load survey test plan for the improved Cobra (ref 7, app A). A detailed description of test maneuvers and techniques is presented in appendix E. Data reduction techniques are described in appendix F. A glossary of terms and abbreviations is presented in appendix G.

8. Test instrumentation as listed in appendix F was installed on the aircraft and the data were recorded on magnetic tape.

CHRONOLOGY

9. The chronology of the AH-1G/Model 212 load survey is as follows:

Test directive received	27	July	1972
Test aircraft received	26	October	1972
Instrumented tail boom received	3	March	1973
Test began	19	March	1973
Test completed	9	May	1973

Table 1. Test Conditions.¹

Test	Average Clean Configuration Gross Weight ² (lb)	Average Hog Configuration Gross Weight ³ (lb)	Average Density Altitude (ft)	Average Calibrated Airspeed (kt)
Steady-state hover ⁴	7900	9400	2300	Hover
Hover maneuvers ⁴	7800	9300	2300	Hover
Sideward and rearward flight ⁵	7500	9200	2900	Hover to 40
Takeoffs and landings	7600	9300	2600	Hover to 70
In-ground-effect acceleration and deceleration ⁶	7600	9200	2600	Hover to 106
Level flight maneuvers	7600	9000	4000	68 to 148
Climb maneuvers	7600	9000	4200	69 to 121
Descents	7700	9000	4200	113 to 129
Mission maneuvers	7500	9100	4000	89 to 181
Autorotational characteristics	7500	9100	2300 (IGE) and 4500	Zero to 127
Throttle chop	7500	9100	4500	68 to 73

¹Average longitudinal center of gravity (cg) at fuselage station (FS) 195.7 (mid).

Approximate main rotor speed: 324 rpm.

²Clean configuration: No external stores.

³Hog configuration: 4 XM159C rocket pods, with sufficient rockets to achieve desired gross weight and cg conditions.

⁴In ground effect (skid height 4 feet). Main rotor speed range from 294 to 324 rpm.

⁵In ground effect (skid height 15 feet).

⁶In ground effect (skid height 15 to 25 feet).

RESULTS AND DISCUSSION

GENERAL

10. A limited tail boom flight load survey was performed on the AH-1G helicopter with a tractor tail rotor and a Model 212 tail rotor installed. Base-line tail boom load data were obtained with the Model 801 tractor tail rotor installation and compared with the Model 212 tail rotor installed on the same helicopter. Both installations were evaluated using the same maneuvers at approximately the same gross weights and density altitudes. During tie-down tests, the Model 212 tail rotor was adjusted to achieve the same tail rotor horsepower with full left pedal application as the Model 801 tail rotor. This report presents data obtained during the load survey. Test data indicate that the AH-1G with the Model 212 tail rotor generally exhibited higher mean loads in the tail rotor pitch links (compression), tail boom lateral bending, and tail rotor shaft than with the Model 801 tail rotor. Higher oscillatory loads in tail boom lateral bending and tail rotor shaft parallel bending were also noted. With the Model 801 installation, mean loads were higher in the tail rotor pitch control tube (tension) and oscillatory loads were higher in the tail rotor pitch links.

TAIL BOOM LOAD SURVEY

11. A tail boom flight load survey was performed to determine the tail boom and tail rotor drive and control component loads imposed by the installation of the Model 212 tail rotor. In-ground-effect maneuvers, forward flight maneuvers, and autorotations were performed with a production tractor tail rotor (Model 801) installed to establish a data base for comparing loads. The test maneuvers were duplicated with the Model 212 tail rotor installed. Figures 1 through 97, appendix H, show the representative mean and oscillatory loads that resulted from this test.

12. Test data indicate that the AH-1G helicopter with the Model 212 tail rotor generally exhibited higher mean loads in the tail rotor pitch links (compression), tail boom lateral bending, and tail rotor shaft than with the Model 801 tail rotor. Higher oscillatory loads in tail boom lateral bending and tail rotor shaft parallel bending were also noted. With the Model 801 installation, mean loads were higher in the tail rotor pitch control tube (tension) and oscillatory loads were higher in the tail rotor pitch links.

13. The fundamental oscillations were at 11 hertz (main rotor 2-per-rotor-revolution (2/rev)) for vertical and lateral tail boom bending, tail fin bending, and upper left-hand fitting stress. Tail rotor pitch links and tail rotor shaft bending loads were at a frequency of 27 hertz (tail rotor 1/rev). The characteristic frequency of the tail rotor pitch control tube axial load was 54 hertz (tail rotor 2/rev).

14. The tail boom vertical and lateral oscillatory bending moments were in phase. Tail fin fore/aft and lateral oscillatory bending moments were 180 degrees out of phase.

TIE-DOWN TESTS

15. Tie-down tests were performed to establish the tail rotor collective pitch settings for the Model 212 tail rotor installation. The maximum referred tail rotor shp (shp/σ) of the Model 801 tail rotor was established as the desired maximum referred horsepower setting for the Model 212 tail rotor. This criterion was established to gain the maximum thrust while remaining within the tail rotor drive train torque rating. At full left pedal, the resulting maximum tail rotor blade angle was 17.7 degrees. The corresponding Model 801 tail rotor blade angle was 19.1 degrees. Figure 98, appendix H, presents the resulting referred shp as a function of pedal position.

CONCLUSIONS

16. The AH-1G helicopter with the Model 212 tail rotor generally exhibited higher mean loads in the tail rotor pitch links (compression), tail boom lateral bending, and tail rotor shaft than with the Model 801 tail rotor. Higher oscillatory loads in tail boom lateral bending and tail rotor shaft parallel bending were also noted. With the Model 801 installation, mean loads were higher in the tail rotor pitch control tube (tension) and oscillatory loads were higher in the tail rotor pitch links.

RECOMMENDATIONS

16. None.

APPENDIX A. REFERENCES

1. Final Report, USAAVNTA, Project No. 66-06, *Engineering Flight Test of the AH-1G Helicopter, Phase B, Part 1*, January 1968.
2. Final Report, USAASTA, Project No. 68-37, *Army Preliminary Evaluation of the AH-1G Tractor Tail Rotor Modification*, June 1969.
3. Engineering Change Proposal, Bell Helicopter Company, AH-1G 350, "Improved Anti-Torque System for the AH-1G Helicopter," 29 August 1967.
4. Technical Manual, TM 55-1520-221-10, *Operator's Manual, Army Model AH-1G Helicopter*, 19 June 1971, with Changes 1 through 6.
5. Message, AVSCOM, AMSAV-EFT, 4-10, subject: Safety-of-Flight Release for Conduct of AH-1G/212 Tail Rotor Evaluation, 131215Z Apr 73.
6. Message, AVSCOM, AMSAV-EFT, 5-06, subject: Safety-of-Flight Release for Conduct of AH-1G/212 Tail Rotor Evaluation, R041350Z May 73.
7. Test Plan, Bell Helicopter Company, Report No. 209-947-131, *Flight Load Survey Test Plan for the Improved Cobra Armament Program*, 30 June 1972.
8. Test Plan, USAASTA, Project No. 72-30, *Tail Rotor Evaluation, AH-1G Helicopter with Model 212 Tail Rotor*, February 1973.

APPENDIX B. TEST DIRECTIVE



DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY AVIATION SYSTEMS COMMAND
PO BOX 209, ST. LOUIS, MO 63166

25 JUL 1972

AMSAV-EFT


SUBJECT: AH-1G/212 Tail Rotor Evaluation

Commanding Officer
US Army Aviation Systems
Test Activity
ATTN: SAVTE-P

This letter transmits AVSCOM Test Directive No. 72-30, subject as above.

FOR THE COMMANDER:

1 Incl
as


ROBERT D. HUBBARD
Acting Chief, Flt Stds & Qual Div
Directorate for RD&E

AVSCOM Test Directive
No. 72-30
AH-1G/212 Tail Rotor Evaluation

1. Purpose.

This test directive tasks ASTA to conduct a flight test evaluation of the Tractor 212 Flex Beam Tail Rotor on the AH-1G Helicopter.

2. Background.

Bell Helicopter recently completed a preliminary load level survey of their Model 212 Tractor Tail Rotor Configuration on the AH-1G Helicopter and the Cobra Product Manager has subsequently requested an Army Flight Test Evaluation be conducted. Indications are that this tail rotor test may be a prelude to a full blown AH-1G IFR evaluation.

3. Test Objective.

To obtain quantitative and qualitative stability and control flight test data on the AH-1G/212 Tractor Tail Rotor Configuration.

4. Special Instructions.

a. Handling qualities are to be evaluated against the MIL-H-8501A IFR handling qualities requirements.

b. The Model 212 flex beam tractor tail rotor will be provided and installed by BHC personnel.

c. Instrumentation of the AH-1G should be initiated at the earliest practical date and will be extensive enough to conduct a follow-on IFR evaluation.

5. Test Schedule.

Tentative schedule is for BHC to initiate tail rotor installation at ASTA the latter part of August 1972 with ASTA flight testing to commence immediately thereafter.

6. Description.

A technical description of the 212 flex beam tractor tail rotor will be provided by on-site BHC personnel.

7. Points of Contact.

AMCPM-CO . . . Mr. C. Gaiser, autovon 698-3304
. . . CWO Gay, autovon 698-3304

AMSAV-EF . . . Mr. J. Dettmer, autovon 698-5446

BHC . . . Mr. G. Nanchy, commercial (817) 280-3231

8. Funding.

The Cobra Product Manager is responsible for reimbursable expense requirements associated with this project and will provide \$6000 to ASTA based on the preliminary estimate.

9. Priority.

AVSCOM Priority Number 8 is assigned.

10. Reports.

Seven copies of an ASTA report in letter format is required to be submitted to AMSAV-EF not later than 45 calendar days after test completion.

11. Security Classification.

Unclassified.

12. Equipment.

The tail rotor will be provided by BHC. All other test and test support is the responsibility of ASTA.

13. Safety of Flight Release.

A safety of flight release will be issued to ASTA by the Flight Standards & Qualification Division prior to initiation of flight testing.

APPENDIX C. TAIL ROTOR DESCRIPTION

TRACTOR TAIL ROTOR (MODEL 801)

1. The tractor tail rotor (Model 801) is a two-bladed, delta-hinge type employing preconing. The blade and yoke assembly is mounted to the tail rotor shaft by means of a delta-hinge trunnion. Blade pitch angle is varied by movement of the tail rotor control pedals. Power to drive the tail rotor is supplied by a takeoff quill on the lower end of the main transmission.

TAIL ROTOR (MODEL 212)

2. The Model 212 tail rotor is a two-bladed delta-three hinge type employing a flex-beam yoke. A double counter-weight arrangement reduces the blade feathering moments at high tail rotor collective pitch settings. Location, power source, and controls are essentially the same as the Model 801 tail rotor.

ANTITORQUE ROTOR DATA

	<u>Model 801</u>	<u>Model 212</u>
Number of blades	2	2
Diameter	8.5 ft	8.5 ft
Blade chord	8.4 in. (constant)	11.5 in. (constant)
Rotor solidity	0.105	0.1436
Blade airfoil	NACA 0010 modified	NACA 0018 at FS 12.75 tapering linearly to BHC cambered blade section with thickness ratio 8.2% at FS 51 (no NACA number)
Blade twist	Zero deg	Zero deg

APPENDIX D. PHOTOGRAPHS

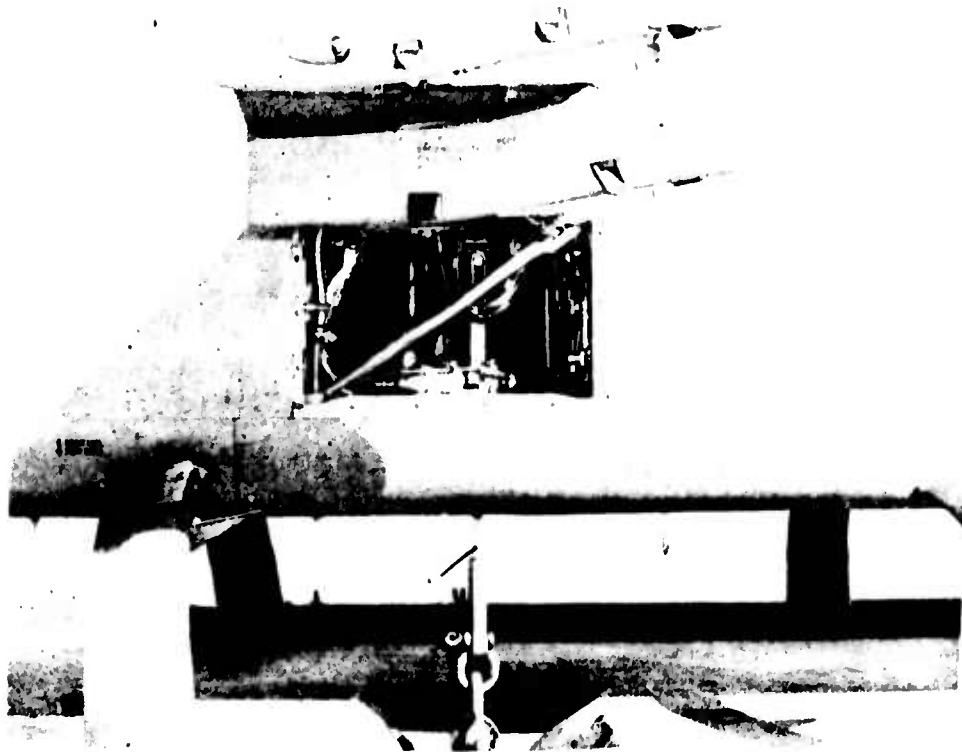


Photo 1. Tie-Down.

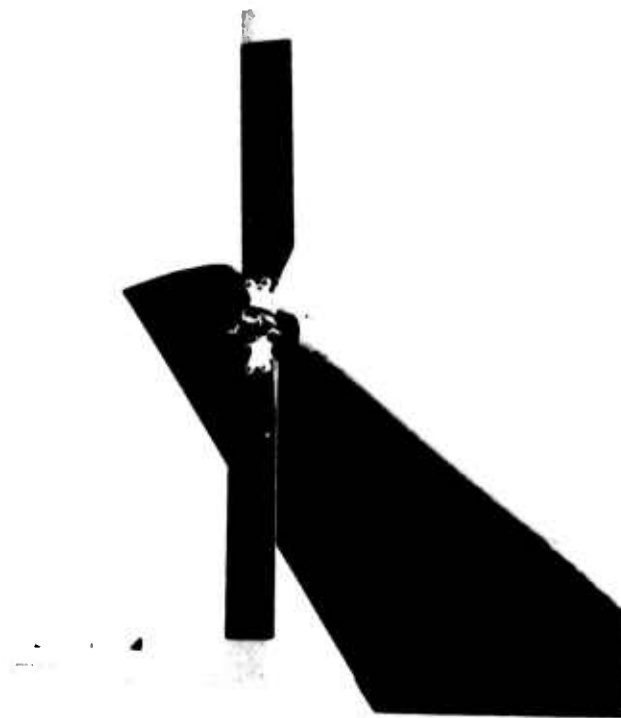


Photo 2. Model 801 Tail Rotor.



Photo 3. Model 212 Tail Rotor.

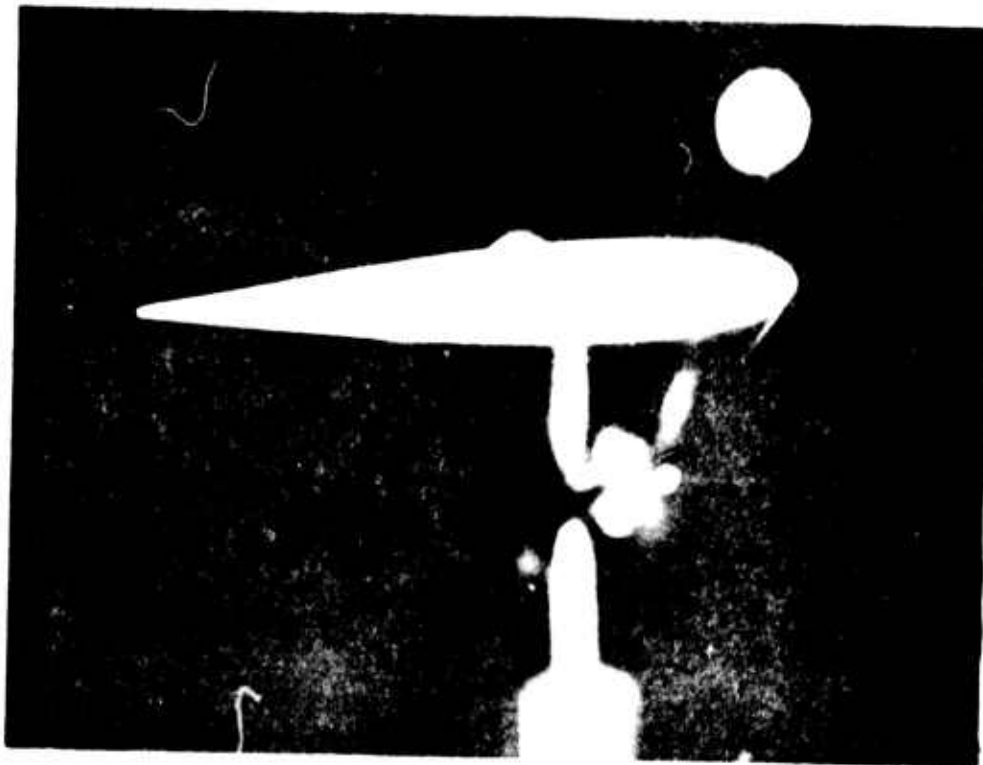


Photo 4. Model 801 Blade Tip.

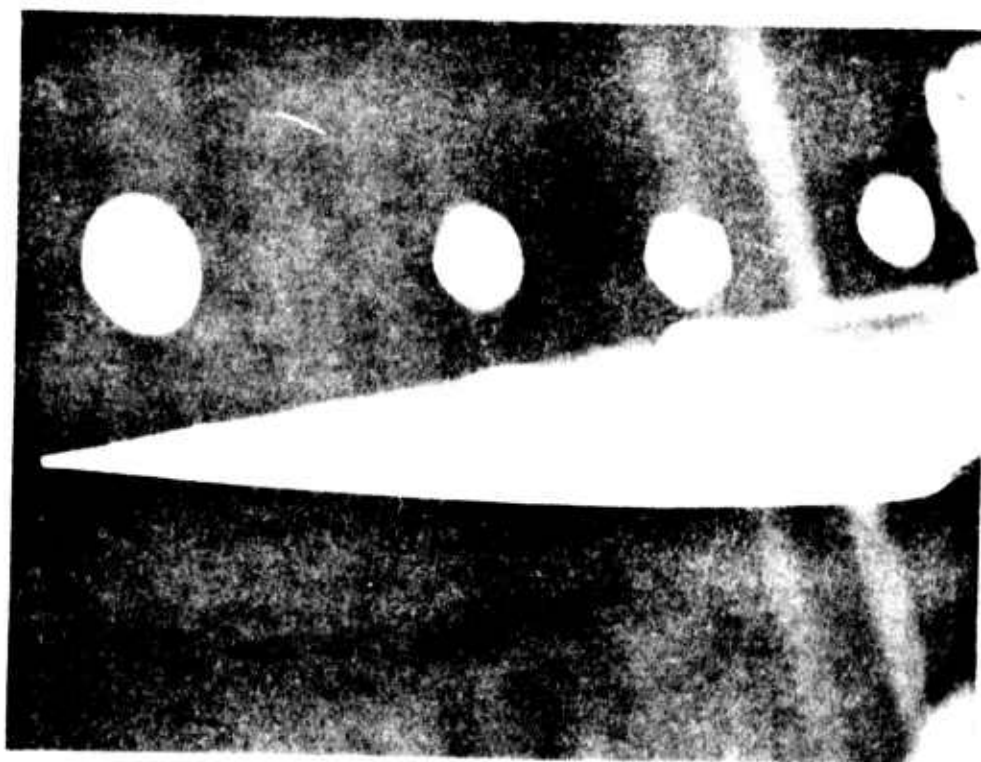


Photo 5. Model 212 Blade Tip.

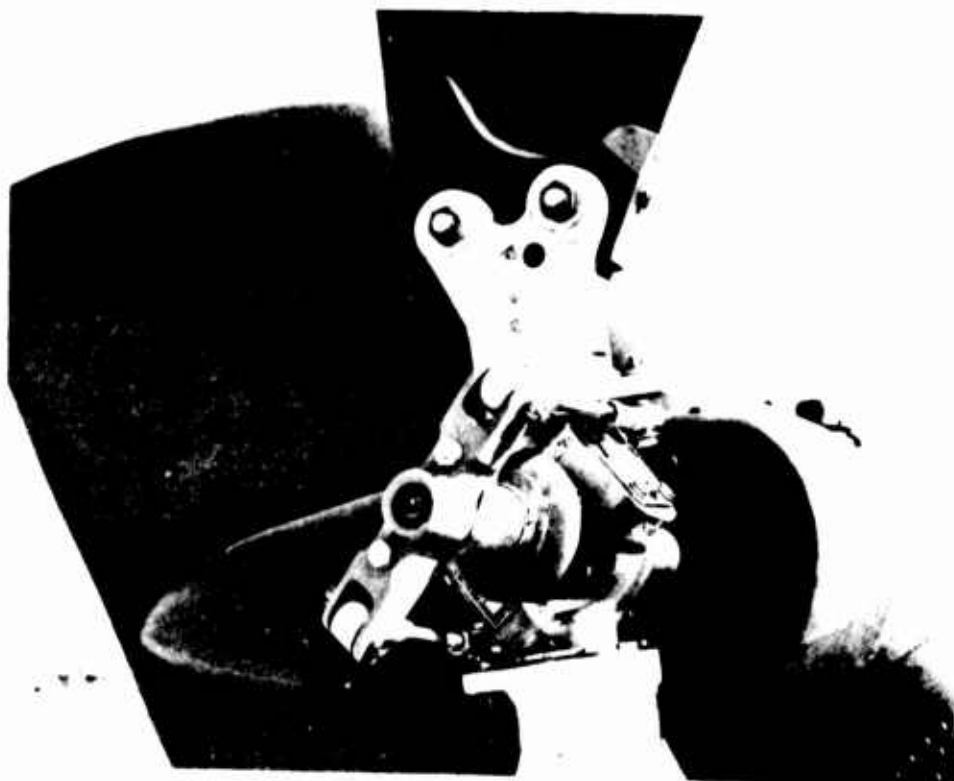


Photo 6. Model 801 Tail Rotor Hub.

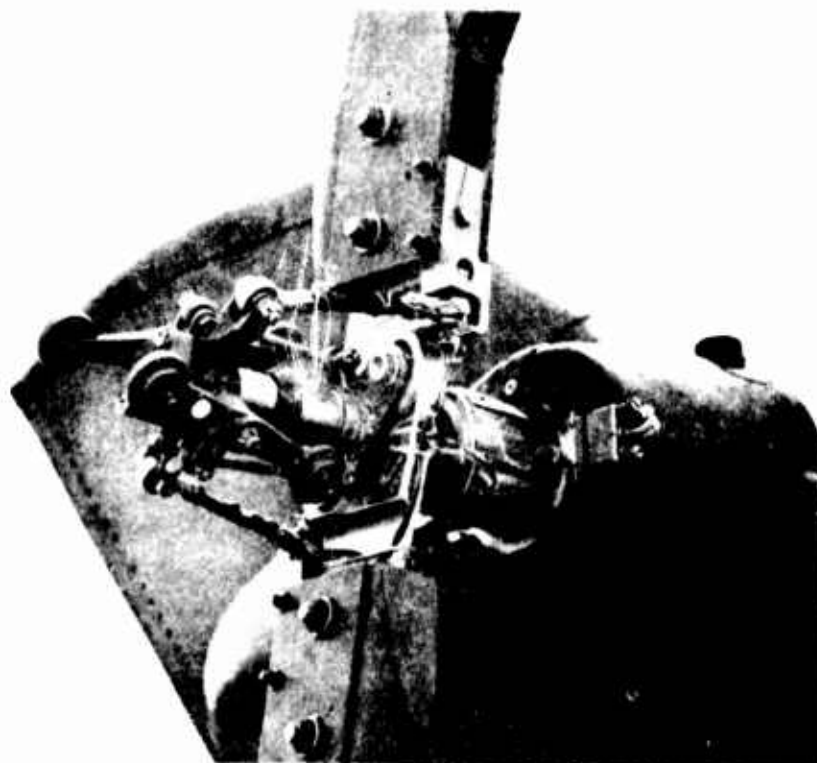


Photo 7. Model 212 Tail Rotor Hub.

APPENDIX E. TEST TECHNIQUES AND MANEUVERS

GENERAL

1. The test techniques and maneuvers used during the Model 212 tail rotor flight load survey are described in this appendix.

In-Ground-Effect Maneuvers

2. **Steady-State Hover.** Steady-state hover tests were conducted by stabilizing the helicopter IGE at the various test rotor speeds, then holding the flight controls fixed while data were recorded.

3. **Hover Turns.** Hover turns were performed by stabilizing the helicopter IGE, then applying directional control to establish the desired turn rate. Turn rate was determined in the cockpit using the ship's system clock and heading indicator. Data were recorded through a full 360-degree turn.

4. **Directional Control Step Inputs.** Hovering pedal steps were executed from a stabilized hover. The magnitude of the input was gaged by using a simple control fixture. Subsequent to the directional control step input, controls were held fixed until the maximum turn rate was established. Pedal steps up to 1 inch control displacement were performed. Data were recorded throughout the maneuver.

5. **Directional Control Reversals.** Hovering pedal reversals (doublets) were conducted from a stabilized hover. Directional control reversals were applied at a frequency of approximately 0.5 hertz. Cyclic and collective controls were held fixed during this maneuver. Directional control reversals were conducted up to 1 inch in each direction.

6. **Low-Speed Translational Flight.** Sideward and rearward flights were conducted IGE at a skid height of 10 to 15 feet to the limit airspeed. A pace vehicle was used to establish the desired ground speed while the helicopter was flown to keep pace with the vehicle. Data were recorded while the aircraft was stabilized.

7. **Takeoffs and Landings.** Normal takeoffs and landings were performed as described in the operator's manual. Jump takeoffs were conducted by stabilizing the helicopter at a power setting which permitted a "light-on-the-skids" condition, skids on the ground, and cyclic centered. The collective pitch control was then rapidly increased to attain maximum allowable horsepower; cyclic and directional controls were adjusted to maintain heading and vertical flight until the helicopter was out of ground effect.

8. Acceleration IGE. In-ground-effect accelerations were initiated from a stabilized IGE hover at a 15-foot skid height. Maximum power was applied and constant altitude and heading were maintained until reaching $0.8V_H$ (V_H is maximum airspeed for level flight). Data were recorded throughout the maneuver.

9. Deceleration IGE. In-ground-effect deceleration and quick-stops were initiated from level flight at $0.8V_H$. Normal decelerations were performed at a 15-foot skid height, quick-stops at a 25-foot skid height. Power was reduced while maintaining a constant skid height and heading. During quick-stops, rotor speed was controlled using a combination of collective pitch application and the rotor speed vernier control on the collective pitch control grip head. Data were recorded throughout the maneuver until recovery to a steady-state hover.

Forward Flight

10. Level Flight. Level flight tests were conducted by stabilizing the helicopter at the test altitude, airspeed, and rotor speed with zero sideslip, then holding controls fixed while data were recorded.

11. Full Power Climbs. Full power (transmission limitation) climbs were initiated from level flight at the test airspeed from below the test altitude. The collective control was rapidly increased and rotor speed adjusted to obtain maximum power. Cyclic and directional controls were adjusted to maintain desired airspeed and zero sideslip. Data were recorded through an altitude band which included the desired test altitude.

12. Level Flight Acceleration. Level flight accelerations were initiated from stabilized level flight at 80 knots calibrated airspeed (KCAS). Maximum power was rapidly applied while constant altitude and zero sideslip were maintained. Data were recorded throughout the acceleration to an airspeed of $0.9V_H$.

13. Partial Power Descents. Partial power descents were initiated from stabilized level flight above the test altitude. The collective control was smoothly decreased to attain the desired rate of descent while maintaining constant rotor speed. Cyclic and directional controls were adjusted to maintain desired airspeed and zero sideslip. Data were recorded through an altitude band to include the desired test altitude.

14. Steady-Heading Sideslips. Steady-heading sideslip tests were performed in level flight (constant altitude) and in 1000-foot-per-minute climbs. Tests were conducted to the sideslip limits for each test airspeed. Data were recorded while stabilized at the desired sideslip angle and airspeed. At the heavy gross weights and high airspeeds where 1000-foot-per-minute climbs could not be maintained with maximum power, the rate of climb for maximum power was used.

15. Constant Altitude Turns. Constant altitude turns, both left and right, were conducted by stabilizing the aircraft at a bank angle necessary to attain 1.3g normal acceleration and adjusting power to maintain level flight at the desired airspeed with zero sideslip. Data were recorded when stabilized in the turn.

16. Directional Control Step Inputs - Level Flight. Pedal steps, left and right, up to 1 inch displacement were executed in stabilized level flight. Cyclic and collective controls were held fixed during the input. Data were recorded throughout the input.

17. Directional Control Reversals - Level Flight. Forward flight pedal reversals up to 1 inch displacement were performed in stabilized level flight. Cyclic and collective controls were held fixed during the inputs. Data were recorded throughout the input and until the resulting aircraft motion had stopped.

Mission Maneuvers

18. Constant Power Turns (Gunnery Turns). Constant power turns were performed both left and right. The helicopter was stabilized at the test airspeed with power adjusted for level flight. A coordinated (ball-centered) turn was established while keeping airspeed constant. Altitude was allowed to vary during the maneuver. Tests were conducted with normal load factors up to 2.0g. Data were recorded when the turn was stabilized.

19. Roll Reversals. Roll reversals were initiated from a steady level turn at the desired bank angle. The reversal was performed by rapidly displacing the cyclic control laterally to attain the desired bank angle in the opposite direction while maintaining ball-centered flight. Collective and engine controls were adjusted during the maneuver only when necessary to prevent an overtorque or rotor overspeed. Data were recorded throughout the maneuver.

20. Gunnery Dives. Gunnery dives were initiated from stabilized level flight. Pushovers were conducted to achieve a 15- to 20-degree nose-down attitude without attaining a normal acceleration less than 0.5g. Left and right rolling pushovers were made to bank angles of 30 degrees. Diving flight was conducted up to limit airspeed. Data were recorded throughout the entry and dive.

21. Pullouts from Gunnery Dives. Gunnery dive recoveries were performed using symmetrical and rolling pullouts from wings level dives. A bank angle of 30 degrees was used during the rolling pullouts. Pullouts were conducted with normal load factors up to 2.0g. Data were recorded throughout the maneuver.

22. Simulated Spray Fire Gunnery Dives. The spray fire dive test was initiated from stabilized level flight at a specified entry airspeed. A pushover was executed straight ahead to establish the test airspeed in a dive. After stabilizing at the desired dive speed, the directional controls were pulsed to simulate spraying machine gun fire from fixed weapons positions. Sideslips were generated in this maneuver to the sideslip limits for each dive airspeed. A symmetrical pullout recovery at 1.5g was made from the spray fire dive. The collective pitch control was held fixed at the entry setting and data were recorded throughout the maneuver.

23. S-Turn Evasive Maneuver. The S-turn maneuver was initiated from stabilized level flight. A series of turns using a 20- to 30-degree bank angle was then executed. The evasive maneuver consisted of a left turn of 10 degrees heading change followed by 30 degrees right heading change, then a left turn with 10 degrees heading change and returning to wings-level. The maneuver was performed with ball-centered (coordinated) flight and constant power. Data were recorded throughout the maneuver.

Autorotations

24. Autorotational Entry. Autorotational entries were initiated from level flight. The maneuver was performed by smoothly decreasing collective pitch while rolling the engine power control twist grip (throttle) to the flight-idle position. Collective pitch control and throttle decrease were coordinated to retain rotor speed within normal operating range. Data were recorded throughout the maneuver.

25. Power Recovery. Power recovery was initiated from stabilized autorotation by smoothly increasing engine power and collective pitch to achieve level powered flight while maintaining rotor speed within the normal operating range. Data were recorded throughout the maneuver.

26. Throttle Chops. Simulated sudden engine failures (throttle chops) were initiated from level flight and maximum power climbs. This was accomplished by rapidly reducing the throttle to the flight-idle position while holding all flight controls fixed. Subsequent to throttle reduction, the flight controls were held fixed for 2 seconds or until aircraft attitude or rotor speed decay necessitated recovery. Data were recorded throughout the maneuver.

27. Autorotation. Stabilized autorotations were normally performed in conjunction with autorotational entries and power recoveries. Data were obtained for straight-ahead autorotational descents and autorotational turns, both left and right, with a 30-degree bank angle. Autorotational approaches were made with power recoveries to an IGE hover. Full autorotational landings were accomplished (power off) with touchdown airspeeds of approximately 10 knots to permit ground runs of approximately 50 feet. Hovering autorotations were initiated from a stabilized hover at a 2-foot skid height by rapidly reducing the throttle to flight-idle, then coordinating collective pitch and flight controls to achieve a gentle vertical touchdown with skids level.

APPENDIX F. DATA REDUCTION AND INSTRUMENTATION

GENERAL

1. A list of parameters considered sufficient to obtain necessary loads data was supplied by AVSCOM to BHC. An AH-1G tail boom was instrumented and calibrated by BHC and exchanged for the original tail boom on the test aircraft. The BHC calibrations were linearly extrapolated when necessary to achieve the desired range of interest. Calibration ranges were derived through a joint effort by BHC and USAASTA based primarily upon previously existing BHC Model 209 helicopter loads data.
2. Flight parameters were recorded on magnetic tape (pulse code modulation) and reduced using a digital computer (EMR 6135).
3. Load parameters except tail rotor shaft torque were recorded on the airborne magnetic tape recorder using frequency modulation to obtain data accurately in the desired frequency range. Tail rotor shaft torque was recorded using pulse code modulation. The parameters were transcribed from the magnetic tape to a visicorder (oscillograph) with a maximum frequency response of 500 hertz and then manually reduced. The data, mean and oscillatory, were read at the point of maximum oscillatory unless an unusually high mean occurred with a superimposed oscillatory that produced a greater peak value. The mean load was defined as the average of the maximum and minimum loads recorded during one cycle of the fundamental oscillation. The oscillatory load was defined to be one-half the difference between the maximum and minimum loads recorded during one cycle of the fundamental oscillation. All load parameter zeros excluded static loads. This was achieved by nulling out any existing gauge readings with the aircraft resting on its skids and rotors stationary.

DATA REDUCTION (Sign Convention¹)

<u>Parameter</u>	<u>Definition</u>
T/R pitch link forces	Positive (+) = tension
T/R pitch cont tube axial force	Positive (+) = tension
T/B vertical bending moment	Positive (+) = boom bending up
T/B lateral bending moment	Positive (+) = force to right
Upper left fitting stress	Positive (+) = clockwise

¹Based on looking forward from tail toward nose of aircraft.

T/F fwd and aft bending moment

Positive (+) = top bending forward

T/F lateral bending moment

Positive (+) = top bending toward tail rotor

T/R shaft parallel bending moment

Positive (+) = red blade positioned aft and parallel with longitudinal axis of aircraft, force red blade toward tail boom

T/R shaft perpendicular bending moment

Positive (+) = red blade positioned up and perpendicular with longitudinal axis of aircraft, force aft at hub

T/B torque

Positive (+) = clockwise

INSTRUMENTATION

Magnetic Tape

	<u>Accuracy</u>	<u>Range of Interest</u>
Main rotor speed	1 rpm	250 to 350
Airspeed (nonlinear)	1 kt	30 to 190
Air temperature	0.5°C	-29 to +50
Engine torque	1 psi	Zero to 50
Tail rotor shaft torque	5 ft-lb	Zero to 800
Directional cont displacement	0.1 in.	Zero to ^{5.82} 6.25
Center-of-gravity normal acceleration	0.1g	-1 to +3
Sideslip angle	1 deg	±30
Roll attitude (bank angle)	1 deg	±45
Yaw rate (turn rate)	1 deg/sec	±45

Oscillograph

T/R pitch link forces (red and white)	25 lb	±650
T/R pitch cont tube axial force	25 lb	±650
T/B vertical bending moment (boom station 50)	5000 in.-lb	+25,000 to -225,000
T/B lateral bending moment (boom station 50)	5000 in.-lb	Zero to +375,000
Upper left fitting stress (approx boom station 50)	100 psi	-2000 to +5000
T/R fwd and aft bending moment (fin station 41)	500 in.-lb	Zero to -40,000
T/F lateral bending moment (fin station 41)	1000 in.-lb	-15,000 to +70,000
T/R shaft parallel bending moment	100 in.-lb	-3000 to +3700
T/R shaft perpendicular bending moment	100 in.-lb	-4500 to +3500
T/R blade pitch (Model 801)	0.5 deg	10.2 R to 19.1 L
T/R blade pitch (model 212)	0.5 deg	10.3 R to 17.7 L
T/B torque (boom station 50)	1000 in.-lb	-15,000 to +170,000

APPENDIX G. GLOSSARY OF TERMS

Clean	No external stores
Cont	Control
Dir	Directional
Displ	Displacement
F	Force
Hog	Four XM159C rocket pods
HVR	Hover
L	Left
M	Bending moment
Perp	Perpendicular
R	Right
T/B	Tail boom
TD	Touchdown
T/F	Tail fin
T/R	Tail rotor

APPENDIX H. TEST DATA

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FIGURE 1
Steady-State Hover
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7780		7810		Gross weight(lb)	9410		9370		
1660		1950		Density altitude(ft)	2730		2310		
5.0		7.0		Air temperature(°C)	13.0		10.0		
296		295		Main rotor speed(rpm)	293		294		
HVR		HVR		Airspeed(KCAS)	HVR		HVR		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
-25	± 75	-250	± 25	T/R red pitch link F(lb)	-75	± 75	-200	± 25	
0	± 50	-175	± 25	T/R white pitch link F(lb)	-100	± 100	-200	± 25	
+125	± 100	+25	± 25	T/R pitch cont tube axial F(lb)	+125	± 75	+25	± 25	
+10000	± 10000	+20000	± 10000	T/B vertical M ² (in-lb)	+10000	± 10000	+25000	± 10000	
+80000	± 10000	+105000	± 10000	T/B lateral M ² (in-lb)	+110000	± 7000	+115000	± 10000	
+1300	± 300	+1500	± 300	Upper left fitting stress ² (psi)	+2400	± 300	+2500	± 300	
-7500	± 4000	-13000	± 4000	T/F forward & aft M ³ (in-lb)	-16000	± 2500	-14500	± 2500	
+18000	± 2000	+22000	± 2000	T/F lateral M ³ (in-lb)	+24000	± 2000	+25000	± 3000	
0	± 700	-100	± 700	T/R shaft parallel M(in-lb)	-400	± 700	+200	± 800	
+500	± 500	+100	± 400	T/R shaft perp M(in-lb)	+300	± 600	-300	± 500	
11.0 L	± 0.5	13.5 L	± 0.5	T/R blade pitch (deg)	14.5 L	± 0.5	15.5 L	± 0.5	
+20000	± 8000	+30000	± 10000	T/B torque ² (in-lb)	+34000	± 6000	+32000	± 8000	
+220	±	+265	±	T/R shaft torque(ft-lb)	+365	±	+370	±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 2
Steady State Hover
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
8000		7830		Gross weight(lb)	9440		9400		
1660		1990		Density altitude(ft)	2690		2360		
5.0		7.0		Air temperature(°C)	12.5		10.5		
314		314		Main rotor speed(rpm)	314		314		
HVR		HVR		Airspeed(KCAS)	HVR		HVR		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
-50	± 100	-200	± 25	T/R red pitch link F(lb)	-50 ± 50	-250 ± 25			
-50	± 75	-150	± 50	T/R white pitch link F(lb)	-75 ± 100	-200 ± 25			
+150	± 100	+25	± 25	T/R pitch cont tube axial F(lb)	+100 ± 75	+25 ± 25			
+5000	± 10000	+10000	± 10000	T/B vertical M ² (in-lb)	+15000 ± 5000	+20000 ± 10000			
+85000	± 10000	+80000	± 10000	T/B lateral M ² (in-lb)	+105000 ± 10000	+115000 ± 10000			
+1300	± 300	+1700	± 400	Upper left fitting stress ² (psi)	+2100 ± 200	+1800 ± 300			
-7000	± 3000	-12000	± 3000	T/F forward & aft M ³ (in-lb)	-13000 ± 2500	-13000 ± 2000			
+19000	± 2000	+20000	± 2000	T/F lateral M ³ (in-lb)	+22000 ± 2000	+25000 ± 2000			
+100	± 800	0	± 700	T/R shaft parallel M(in-lb)	-400 ± 600	+200 ± 800			
+400	± 600	+200	± 600	T/R shaft perp M(in-lb)	+300 ± 600	-300 ± 600			
10.0 L	± 0.5	11.0 L	± 0.5	T/R blade pitch (deg)	11.5 L ± 0.5	13.5 L ± 0.5			
+22000	± 8000	+28000	± 10000	T/B torque ² (in-lb)	+28000 ± 4000	+38000 ± 9000			
+190	±	+220	±	T/R shaft torque(ft-lb)	+300 ±	+330 ±			

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 3
Steady-State Hover
AH-1G S/N 71-20985

CLEAN CONFIGURATION						HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹		801		212	
7810		7860		Gross weight(lb)		9450		9430	
1680		2000		Density altitude(ft)		2690		2230	
5.0		7.0		Air temperature(°C)		12.5		10.0	
325		324		Main rotor speed(rpm)		324		324	
HVR		HVR		Airspeed(KCAS)		HVR		HVR	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
-50	± 50	-175	± 25	T/R red pitch link F(lb)		-50 ± 75		-225 ± 25	
-50	± 50	-150	± 50	T/R white pitch link F(lb)		-75 ± 75		-200 ± 50	
+125	± 50	+100	± 50	T/R pitch cont tube axial F(lb)		+100 ± 50		+100 ± 50	
+10000	±10000	+15000	± 5000	T/B vertical M ² (in-lb)		+10000± 5000		+10000 ±10000	
+30000	±10000	+80000	±10000	T/B lateral M ² (in-lb)		+100000±10000		+110000 ±15000	
+1300	± 200	+1400	± 200	Upper left fitting stress ² (psi)		+2100 ± 200		+2100 ± 400	
-9000	± 3000	-10000	± 2500	T/F forward & aft M ³ (in-lb)		-13000± 2500		-13000 ± 4000	
+19000	± 2000	+20000	± 2000	T/F lateral M ³ (in-lb)		+22000± 1800		+25000± 3000	
0	± 800	+100	± 800	T/R shaft parallel M(in-lb)		-400 ± 700		+200 ± 900	
-100	± 600	0	± 600	T/R shaft perp M(in-lb)		+200 ± 500		-200 ± 600	
10 L	± 0.5	11.5 L	± 0.5	T/R blade pitch (deg)		10.5 L ± 0.5		13.0 L ± 0.5	
+24000	± 8000	+28000	±10000	T/B torque ² (in-lb)		+24000± 4000		+38000± 8000	
+200	±	+210	±	T/R shaft torque(ft-lb)		+290 ±		+315 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 4
Steady-State Hover
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
212		212		FLIGHT PARAMETER ¹	212		212		
7820		7840		Gross weight(lb)	9390		9410		
2000		2020		Density altitude(ft)	2360		2270		
7.0		7.0		Air temperature(°C)	10.5		10.0		
303		319		Main rotor speed(rpm)	303		319		
HVR		HVR		Airspeed(KCAS)	HVR		HVR		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
-175	± 25	-175	± 25	T/R red pitch link F(lb)	-225 ± 50		-200 ± 50		
-150	± 25	-150	± 25	T/R white pitch link F(lb)	-225 ± 50		-200 ± 50		
0	± 25	0	± 25	T/R pitch cont tube axial F(lb)	+25 ± 50		-25 ± 25		
+15000	±10000	+15000	±10000	T/B vertical M ² (in-lb)	+30000±10000		+20000 ±10000		
+90000	±10000	+100000	± 5000	T/B lateral M ² (in-lb)	+160000±15000		+110000 ±15000		
+1500	± 400	+1400	± 300	Upper left fitting stress ² (psi)	+2000± 300		+2100 ± 400		
-18500	± 3000	-13500	± 3000	T/F forward & aft M ³ (in-lb)	-15500±2500		-12500 ± 3500		
+22000	±2000	+21000	±2000	T/F lateral M ³ (in-lb)	+26000±3000		+23000 ± 4000		
0	± 800	+100	± 900	T/R shaft parallel M(in-lb)	0 ± 800		+100 ± 700		
0	± 600	0	± 600	T/R shaft perp M(in-lb)	-200 ± 600		0 ± 600		
12.0 L ± 0.5		12.0 L ± 0.5		T/R blade pitch (deg)	15.5 L ± 0.5		13.0 L ± 0.5		
+30000	±10000	+28000	±10000	T/B torque ² (in-lb)	+36000± 6000		+36000 ± 6000		
+250	±	+225	±	T/R shaft torque(ft-lb)	+390 ±		+320 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 5
Hover Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
			7780	Gross weight(lb)		9110		9310	
			1970	Density altitude(ft)		1970		2020	
			65	Air temperature(°C)		7		7	
			323	Main rotor speed(rpm)		323		324	
			HVR	Airspeed(KCAS)		HVR		HVR	
			18 LT	Turn rate(deg/sec)		14 LT		21 LT	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	-200	± 50		T/R red pitch link F(lb)	-50 ± 100		-225 ± 50		
±	-175	± 50		T/R white pitch link F(lb)	-25 ± 75		-200 ± 75		
±	0	± 25		T/R pitch cont tube axial F(lb)	+125 ± 75		0 ± 25		
±	+15000	± 10000		T/B vertical M ² (in-lb)	+15000 ± 10000		+20000 ± 10000		
±	+75000	± 10000		T/B lateral M ² (in-lb)	+165000 ± 15000		+108000 ± 10000		
±	+1300	± 300		Upper left fitting stress ² (psi)	+2000 ± 300		+2100 ± 400		
±	-11000	± 4000		T/F forward & aft M ³ (in-lb)	-13500 ± 3500		-12500 ± 2500		
±	+21000	± 2000		T/F lateral M ³ (in-lb)	+25000 ± 2000		+23000 ± 2000		
±	0	± 700		T/R shaft parallel M(in-lb)	0 ± 800		+100 ± 800		
±	+100	± 600		T/R shaft perp M(in-lb)	0 ± 800		+400 ± 700		
±	12.5 L	± 0.5		T/R blade pitch (deg)	12 L ± 0.5		12.5 L ± 0.5		
±	+28000	± 12000		T/B torque ² (in-lb)	+32000 ± 8000		+32000 ± 8000		
±	+260	±		T/R shaft torque(ft-lb)	+295 ±		+330 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 6
Hover Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7800		7790		Gross weight (lb)	9070		9390	
2480		3690		Density altitude (ft)	2020		2650	
11.5		19.5		Air temperature (°C)	7.5		14.0	
322		322		Main rotor speed (rpm)	324		322	
HVR		HVR		Airspeed (KCAS)	HVR		HVR	
37		38		Turn rate (deg/sec)	32		29	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-50	±200	-300	±75	T/R red pitch link F(lb)	-75	±175	-225	±75
-150	±225	-225	±75	T/R white pitch link F(lb)	-75	±200	-225	±50
+125	±100	+25	±25	T/R pitch cont tube axial F(lb)	+175	±75	+25	±25
+10000	±10000	+20000	±15000	T/B vertical M ² (in-lb)	+15000	±10000	+20000	±5000
+85000	±10000	+95000	±20000	T/B lateral M ² (in-lb)	+95000	±15000	+115000	±10000
+2200	±200	+3100	±400	Upper left fitting stress ² (psi)	+2200	±400	+2500	±100
-14500	±3000	-14000	±4000	T/F forward & aft M ³ (in-lb)	-13000	±5000	-13000	±3500
+21000	±2000	+21000	±2000	T/F lateral M ³ (in-lb)	+24000	±2000	+26000	±2000
0	±1000	+200	±900	T/R shaft parallel M (in-lb)	-100	±900	-200	±700
+200	±300	+300	±600	T/R shaft perp M (in-lb)	+200	±600	+300	±700
12.0 L	±0.5	13.0 L	±0.5	T/R blade pitch (deg)	13.5 L	±0.5	13.5 L	±0.5
+32000	±6000	+32000	±10000	T/B torque ² (in-lb)	+38000	±6000	+46000	±10000
+300	±	+335	±	T/R shaft torque (ft-lb)	+345	±	+350	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 7
Hover Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION			
801	212	FLIGHT PARAMETER ¹		801	212		
	7800	Gross weight(lb)		9090	9330		
	1950	Density altitude(ft)		1970	2050		
	6.5	Air temperature(°C)		7	7		
	323	Main rotor speed(rpm)		323	325		
	HVR	Airspeed(KCAS)		HVR	HVR		
	17	Turn rate(deg/sec)		20	21		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC
±	-175	± 50		T/R red pitch link F(lb)		-100 ± 150	-225 ± 50
±	-150	± 50		T/R white pitch link F(lb)		-100 ± 75	-175 ± 75
±	0	± 25		T/R pitch cont tube axial F(lb)		+175 ± 75	0 ± 50
±	+20000	± 10000		T/B vertical M ² (in-lb)		+15000 ± 10000	+20000 ± 10000
±	+90000	± 10000		T/B lateral M ² (in-lb)		+105000 ± 10000	+112000 ± 15000
±	+1400	± 300		Upper left fitting stress ² (psi)		+2200 ± 300	+1900 ± 400
±	-12000	± 7000		T/F forward & aft M ³ (in-lb)		-12500 ± 2500	-13500 ± 4500
±	+21000	± 2000		T/F lateral M ³ (in-lb)		+25000 ± 3000	+25000 ± 3000
±	+100	± 1000		T/R shaft parallel M(in-lb)		-100 ± 800	+200 ± 1100
±	+200	± 600		T/R shaft perp M(in-lb)		0 ± 600	+400 ± 750
±	12.4	± 0.5		T/R blade pitch (deg)		13.54 ± 0.5	11.54 ± 0.5
±	+28000	± 10000		T/B torque ² (in-lb)		+38000 ± 8000	39000 ± 10000
±	+240	±		T/R shaft torque(ft-lb)		+340 ±	+290 ±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 8
Hover Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7780		7800		Gross weight(lb)	9080		9400	
2550		3690		Density altitude(ft)	2020		2610	
12.0		19.5		Air temperature(°C)	7.5		14.0	
322		323		Main rotor speed(rpm)	324		323	
HVR		HVR		Airspeed(KCAS)	HVR		HVR	
31		34		Turn rate(deg/sec)	31		28	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-50	±175	-200	±75	T/R red pitch link F(lb)	-75	±200	-175	±100
-125	±150	-175	±75	T/R white pitch link F(lb)	-50	±250	-200	±75
+75	±100	0	±50	T/R pitch cont tube axial F(lb)	+150	±100	-25	±25
+10000	±5000	+25000	±10000	T/B vertical M ² (in-lb)	+20000	±10000	+108000	±10000
+85000	±5000	+95000	±5000	T/B lateral M ² (in-lb)	+110000	±10000	+115000	±10000
+1600	±200	+1000	±200	Upper left fitting stress ² (psi)	+2300	±300	+2400	±200
-12000	±4000	-14500	±4500	T/F forward & aft M ³ (in-lb)	-11000	±6000	-11000	±5000
+19000	±2000	+22000	±3000	T/F lateral M ³ (in-lb)	+26000	±4000	+24000	±3000
+100	±1000	+400	±1300	T/R shaft parallel M(in-lb)	0	±800	-200	±1300
+300	±800	+300	±1000	T/R shaft perp M(in-lb)	0	±600	+300	±1100
8.5 L	±0.5	10.5 L	±0.5	T/R blade pitch (deg)	12.0 L	±0.5	12.0 L	±0.5
+32000	±8000	+28000	±8000	T/B torque ² (in-lb)	+38000	±8000	+40000	±6000
+195	±	+195	±	T/R shaft torque(ft-lb)	+280	±	+220	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 9
Left Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7720		Gross weight(lb)			9320		
		1980		Density altitude(ft)			2380		
		6.5		Air temperature(°C)			10.5		
		324		Main rotor speed(rpm)			324		
		HVR		Airspeed(KCAS)			HVR		
		0.5		Dir cont displ(in)			0.8		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	-275	± 50		T/R red pitch link F(lb)	±	-275	± 75		
±	-230	± 50		T/R white pitch link F(lb)	±	-275	± 50		
±	+150	± 50		T/R pitch cont tube axial F(lb)	±	0	± 50		
±	+15000	±10000		T/B vertical M ² (in-lb)	±	+25000	±15000		
±	+130000	±5000		T/B lateral M ² (in-lb)	±	+130000	±25000		
±	+1800	±200		Upper left fitting stress ² (psi)	±	+2500	± 600		
±	-13000	±2500		T/F forward & aft M ³ (in-lb)	±	-16500	± 3500		
±	+24000	±2000		T/F lateral M ³ (in-lb)	±	+25000	± 5000		
±	+100	± 700		T/R shaft parallel M(in-lb)	±	+100	± 900		
±	+100	± 600		T/R shaft perp M(in-lb)	±	-200	± 800		
±	13.0 L	± 0.5		T/R blade pitch (deg)	±	13.0 L	± 0.5		
±	+28000	±10000		T/B torque ² (in-lb)	±	+36000	±10000		
±	+230	±		T/R shaft torque(ft-lb)	±	+300	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 10
Left Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212	
7770		7760		Gross weight(lb)	9380		9340	
2580		3750		Density altitude(ft)	2820		2560	
12.0		19.5		Air temperature(°C)	13.0		13.5	
319		320		Main rotor speed(rpm)	324		324	
HVR		HVR		Airspeed(KCAS)	HVR		HVR	
1.3		1.0		Dir cont displ(in)	1.0		1.0	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-100 ± 175		-900 ± 125		T/R red pitch link F(lb)	-125 ± 50		-275 ± 75	
-200 ± 225		-250 ± 100		T/R white pitch link F(lb)	-150 ± 50		-250 ± 75	
+200 ± 125		-25 ± 50		T/R pitch cont tube axial F(lb)	+225 ± 100		0 ± 25	
+20000 ± 5000		+15000 ± 10000		T/B vertical M ² (in-lb)	+20000 ± 5000		+20000 ± 5000	
+120000 ± 100000		+35000 ± 15000		T/B lateral M ² (in-lb)	+130000 ± 5000		+135000 ± 5000	
+2300 ± 300		+2400 ± 300		Upper left fitting stress ² (psi)	+2500 ± 200		+2500 ± 200	
-21000 ± 5000		-12000 ± 5000		T/F forward & aft M ³ (in-lb)	-22000 ± 4000		-15500 ± 3500	
+29000 ± 2000		+23000 ± 3000		T/F lateral M ³ (in-lb)	+31000 ± 2000		+26000 ± 3000	
+100 ± 1300		+200 ± 900		T/R shaft parallel M(in-lb)	-500 ± 700		-400 ± 1100	
+300 ± 800		+200 ± 700		T/R shaft perp M(in-lb)	+400 ± 800		+200 ± 700	
17.0 L ± 0.5		13.5 L ± 0.5		T/R blade pitch (deg)	17.5 L ± 0.5		12.5 L ± 0.5	
+44000 ± 4000		+36000 ± 10000		T/B torque ² (in-lb)	+40000 ± 6000		+40000 ± 8000	
+400 ±		+350 ±		T/R shaft torque(ft-lb)	+695 ±		+650 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 11
Right Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7750		Gross weight(lb)			9330		
		2000		Density altitude(ft)			2380		
		6.5		Air temperature(°C)			10.5		
		324		Main rotor speed(rpm)			325		
		HVR		Airspeed(KCAS)			HVR		
		0.5		Dir cont displ(in)			0.7		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±		-125 ± 25		T/R red pitch link F(lb)	±		-175 ± 50		
±		-150 ± 50		T/R white pitch link F(lb)	±		-150 ± 50		
±		-150 ± 50		T/R pitch cont tube axial F(lb)	±		-25 ± 50		
±		+10000 ± 10000		T/B vertical M ² (in-lb)	±		+20000 ± 10000		
±		+90000 ± 10000		T/B lateral M ² (in-lb)	±		+105000 ± 10000		
±		+1100 ± 300		Upper left fitting stress ² (psi)	±		+1800 ± 300		
±		-8000 ± 3000		T/F forward & aft M ³ (in-lb)	±		-9500 ± 3500		
±		+18000 ± 2000		T/F lateral M ³ (in-lb)	±		+20000 ± 3000		
±		+200 ± 1000		T/R shaft parallel M(in-lb)	±		+300 ± 1100		
±		+100 ± 600		T/R shaft perp M(in-lb)	±		-100 ± 700		
±		8.5 L ± 0.5		T/R blade pitch (deg)	±		10.0 L ± 0.5		
±		+24000 ± 10000		T/B torque ² (in-lb)	±		+30000 ± 10000		
±		+210 ±		T/R shaft torque(ft-lb)	±		+195 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 12
Right Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801	212				801	212		
7770	7770			Gross weight(lb)	9340	9370		
1660	3640			Density altitude(ft)	2730	2590		
5.0	19.5			Air temperature(°C)	13.0	13.5		
324	326			Main rotor speed(rpm)	324	324		
HVR	HVR			Airspeed(KCAS)	HVR	HVR		
1.1	0.7			Dir cont displ(in)	1.0	1.0		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	±200	-150	±125	T/R red pitch link F(lb)	0	±150	-175	±75
+25	±175	-125	±150	T/R white pitch link F(lb)	-50	±150	-200	±100
0	±150	-75	±75	T/R pitch cont tube axial F(lb)	+75	±125	-25	±50
0	±10000	+5000	±10000	T/B vertical M ² (in-lb)	+5000	±5000	+20000	±10000
+60000	±10000	+90000	±15000	T/B lateral M ² (in-lb)	+75000	±5000	+105000	±5000
+900	±300	+1900	±300	Upper left fitting stress ² (psi)	+1700	±200	+2100	±200
-3500	±3500	+3500	±5000	T/F forward & aft M ³ (in-lb)	-6000	±3500	+2000	±5000
+10000	±2000	+17000	±4000	T/F lateral M ³ (in-lb)	+12000	±1000	+24000	±3000
0	±800	+400	±1500	T/R shaft parallel M(in-lb)	-300	±800	-300	±1200
+100	±700	+400	±800	T/R shaft perp M(in-lb)	+400	±700	+600	±900
4.0 L	±0.5	7.5 L	±0.5	T/R blade pitch (deg)	5.0 L	±0.5	12.0 L	±0.5
+12000	±8000	+26000	±10000	T/B torque ² (in-lb)	+20000	±6000	+46000	±10000
+100	±	+115	±	T/R shaft torque(ft-lb)	+95	±	+300	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 13
Left Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
7760		7680		Gross weight(lb)		9330		9300	
1730		1970		Density altitude(ft)		2820		2330	
5.0		7.0		Air temperature(°C)		13.5		10.5	
324		324		Main rotor speed(rpm)		324		324	
HVR		HVR		Airspeed(KCAS)		HVR		HVR	
± 0.8		± 0.5		Dir cont displ(in)		± 0.7		± 0.5	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
-50 ± 50		-225 ± 75		T/R red pitch link F(lb)		-75 ± 75		-275 ± 50	
-50 ± 50		-200 ± 75		T/R white pitch link F(lb)		-100 ± 100		-275 ± 50	
+150 ± 100		-150 ± 50		T/R pitch cont tube axial F(lb)		+125 ± 75		-50 ± 50	
+15000 ± 10000		+20000 ± 5000		T/B vertical M ² (in-lb)		+25000 ± 5000		+30000 ± 10000	
+100000 ± 10000		+115000 ± 5000		T/B lateral M ² (in-lb)		+115000 ± 5000		+125000 ± 10000	
+1600 ± 300		1400 ± 200		Upper left fitting stress ² (psi)		+2600 ± 200		+2500 ± 300	
-12000 ± 4000		-13500 ± 2500		T/F forward & aft M ³ (in-lb)		-19000 ± 2500		-15000 ± 3000	
+24000 ± 2000		+25000 ± 2000		T/F lateral M ³ (in-lb)		+26000 ± 2000		+30000 ± 3000	
0 ± 800		-100 ± 900		T/R shaft parallel M(in-lb)		-400 ± 700		+200 ± 1000	
0 ± 500		0 ± 700		T/R shaft perp M(in-lb)		+400 ± 400		-200 ± 600	
12.5 L ± 0.5		13.7 L ± 0.5		T/R blade pitch (deg)		13.5 L ± 0.5		15.0 L ± 0.5	
+30000 ± 8000		+30000 ± 10000		T/B torque ³ (in-lb)		+40000 ± 6000		+44000 ± 8000	
+315 ±		+250 ±		F/R shaft torque(ft-lb)		+440 ±		+425 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 14
Left Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7140		7730		Gross weight(lb)	9300		9300		
1680		3720		Density altitude(ft)	2840		2330		
5.0		20.0		Air temperature(°C)	14.0		10.5		
324		324		Main rotor speed(rpm)	325		324		
HVR		HVR		Airspeed(KCAS)	HVR		HVR		
± 1.4		± 1.1		Dir cont displ(in)	± 1.2		± 1.1		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
- 75	± 150	-300	± 25	T/R red pitch link F(lb)	-125 ± 50		-300 ± 50		
-100 ± 150		-300 ± 50		T/R white pitch link F(lb)	-200 ± 100		-275 ± 50		
+200 ± 200		+150 ± 50		T/R pitch cont tube axial F(lb)	+200 ± 75		+50 ± 50		
+20000 ± 10000		+20000 ± 10000		T/B vertical M ² (in-lb)	+25000 ± 5000		+25000 ± 5000		
+115000 ± 10000		+115000 ± 20000		T/B lateral M ² (in-lb)	+130000 ± 5000		+125000 ± 10000		
+1900 ± 1800		+2200 ± 500		Upper left fitting stress ² (psi)	+2600 ± 100		2200 ± 300		
-16500 ± 4500		-20000 ± 5000		T/F forward & aft M ³ (in-lb)	-23000 ± 3000		-17000 ± 3000		
+30000 ± 2000		+29000 ± 2000		T/F lateral M ³ (in-lb)	+30000 ± 2000		+29000 ± 2000		
0 ± 900		+200 ± 900		T/R shaft parallel M(in-lb)	-500 ± 700		+200 ± 1000		
0 ± 600		+400 ± 500		T/R shaft perp M(in-lb)	+400 ± 900		+200 ± 600		
17.0 L ± 0.5		16.0 L ± 0.5		T/R blade pitch (deg)	17.5 L ± 0.5		15.0 L ± 0.5		
+36000 ± 10000		+38000 ± 8000		T/B torque ² (in-lb)	+46000 ± 4000		+41000 ± 8000		
+470 ±		+455 ±		T/R shaft torque(ft-lb)	+640 ±		+430 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 15
Right Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7740		7750		Gross weight (lb)	9310		9310	
1700		3720		Density altitude (ft)	2840		2350	
5.0		20.0		Air temperature (°C)	14.0		10.5	
324		324		Main rotor speed (rpm)	324		324	
HVR		HVR		Airspeed (KCAS)	HVR		HVR	
± 0.9		± 0.7		Dir cont displ (in)	± 0.7		± 0.5	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	± 100	-125	± 50	T/R red pitch link F(lb)	0	± 25	-125	± 25
+25	± 100	-100	± 50	T/R white pitch link F(lb)	-50	± 50	-125	± 25
0	± 75	-75	± 50	T/R pitch cont tube axial F(lb)	0	± 50	-150	± 50
0	± 10000	+16000	± 10000	T/B vertical M ² (in-lb)	+5000	± 5000	+15000	± 5000
+50000	± 20000	+65000	± 10000	T/B lateral M ² (in-lb)	70000	± 5000	+85000	± 10000
+900	± 300	+1500	± 300	Upper left fitting stress ² (psi)	+1700	± 100	1700	± 400
-3000	± 4000	-6500	± 3500	T/F forward & aft M ³ (in-lb)	-9500	± 2500	-8500	± 4500
+10000	± 2000	+11000	± 2000	T/F lateral M ³ (in-lb)	+12000	± 1000	+14000	± 1000
+100	± 700	+100	± 800	T/R shaft parallel M (in-lb)	+200	± 700	+200	± 800
0	± 500	+200	± 900	T/R shaft perp M (in-lb)	+400	± 400	0	± 600
4.5 L	± 0.5	6.5 L	± 0.5	T/R blade pitch (deg)	5.5 L	± 0.5	9.0 L	± 0.5
+2000	± 8000	+20000	± 12000	T/B torque ² (in-lb)	+24000	± 6000	+26000	± 6000
+85	±	+100	±	T/R shaft torque (ft-lb)	+95	±	+180	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 16
Right Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION						HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹		801		212		
7730		7750		Gross weight(lb)		9290		8850		
1730		3720		Density altitude(ft)		2860		3280		
5.0		20.0		Air temperature(°C)		14.0		17.0		
324		324		Main rotor speed(rpm)		324		324		
HVR		HVR		Airspeed(KCAS)		HVR		HVR		
± 1.1		± 0.8		Dir cont displ(in)		± 1.0		± 0.7		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC	
+25	± 100	-150	± 25	T/R red pitch link F(lb)		0	± 25	-150	± 25	
+25	± 50	-100	± 50	T/R white pitch link F(lb)		-50	± 25	-150	± 25	
-25	± 100	-75	± 50	T/R pitch cont tube axial F(lb)		0	± 50	-150	± 50	
0	± 5000	+15000	± 10000	T/B vertical M ² (in-lb)		0	± 5000	+15000	± 10000	
+40000	± 15000	+65000	± 10000	T/B lateral M ² (in-lb)		+55000	± 3000	+85000	± 15000	
+700	± 300	+1600	± 200	Upper left fitting stress ² (psi)		+1300	± 200	+1700	± 300	
-3000	± 4000	-8500	± 2500	T/F forward & aft M ³ (in-lb)		-7000	± 3000	-8500	± 3000	
+8000	± 2000	+11000	± 2000	T/F lateral M ³ (in-lb)		+10000	± 1000	+15000	± 1000	
+200	± 600	+400	± 800	T/R shaft parallel M(in-lb)		-400	± 600	+200	± 1000	
0	± 500	+300	± 900	T/R shaft perp M(in-lb)		+400	± 600	-200	± 700	
3.5 L	± 0.5	6.5 L	± 0.5	T/R blade pitch (deg)		4.0 L	± 0.5	9.0 L	± 0.5	
+14000	± 8000	+22000	± 12000	T/B torque ² (in-lb)		+18000	± 6000	+26000	± 5000	
+80	±	+100	±	T/R shaft torque(ft-lb)		+100	±	+180	±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 17
Right Sideward Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7330		7620		Gross weight (lb)	9040		9230	
1990		3850		Density altitude(ft)	2650		2660	
7.5		21.		Air temperature(°C)	12.0		14.0	
326		326		Main rotor speed(rpm)	325		325	
30		30		Airspeed(KCAS)	30		30	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-125	± 100	-325	± 50	T/R red pitch link F(lb)	-125	± 100	-325	± 50
-125	± 100	-275	± 50	T/R white pitch link F(lb)	-200	± 125	-300	± 50
+250	± 75	+50	± 50	T/R pitch cont tube axial F(lb)	+200	± 100	+75	± 50
+20,000	± 10,000	+20,000	± 20,000	T/B vertical M ² (in-lb)	+10,000	± 10,000	+30,000	± 10,000
+70,000	± 10,000	+60,000	± 15,000	T/B lateral M ² (in-lb)	+70,000	± 5000	+105,000	± 10,000
+1300	± 200	+1800	± 500	Upper left fitting stress ² (psi)	+2600	± 200	+2200	± 400
-14,000	± 5000	-18,500	± 4500	T/F forward & aft M ³ (in-lb)	-15,500	± 3500	-18,000	± 3500
+22,000	± 2000	+17,000	± 2000	T/F lateral M ³ (in-lb)	+23,000	± 2000	+20,000	± 2000
0	± 1000	+800	± 900	T/R shaft parallel M(in-lb)	-500	± 800	-400	± 700
+100	± 600	+200	± 700	T/R shaft perp M(in-lb)	+500	± 500	+800	± 600
14. L	± .5	+13.5	± .5	T/R blade pitch (deg)	15. L	± 0.5	15.5 L	± 0.5
+36,000	± 8000	+28,000	± 8000	T/B torque ² (in-lb)	+36,000	± 6000	+30,000	± 4000
+300	±	+300	±	T/R shaft torque(ft-lb)	+430	±	+430	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 18
Right Sideward Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
				Gross weight(lb)		9210			
				Density altitude(ft)		2660			
				Air temperature(°C)		14.0			
				Main rotor speed(rpm)		325			
				Airspeed(KCAS)		40			
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±		±		T/R red pitch link F(lb)	±	-350	± 50		
±		±		T/R white pitch link F(lb)	±	-300	± 50		
±		±		T/R pitch cont tube axial F(lb)	±	+100	± 50		
±		±		T/B vertical M ² (in-lb)	±	+30,000	± 15,000		
±		±		T/B lateral M ² (in-lb)	±	+95,000	± 20,000		
±		±		Upper left fitting stress ² (psi)	±	+1200	± 400		
±		±		T/F forward & aft M ³ (in-lb)	±	-11,500	± 4500		
±		±		T/F lateral M ³ (in-lb)	±	+22,000	± 2000		
±		±		T/R shaft parallel M(in-lb)	±	-400	± 800		
±		±		T/R shaft perp M(in-lb)	±	+200	± 700		
±		±		T/R blade pitch (deg)	±	17. L	± 0.5		
±		±		T/B torque ² (in-lb)	±	+36,000	± 6000		
±		±		T/R shaft torque(ft-lb)	±	+430	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 19
Left Sideward Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7350		7630		Gross weight(lb)	9030		9270	
2030		3810		Density altitude(ft)	2720		2660	
8.0		20.5		Air temperature(°C)	12.5		14.0	
325		326		Main rotor speed(rpm)	326		326	
30		30		Airspeed(KCAS)	30		30	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+100	± 75	+25	± 50	T/R red pitch link F(lb)	+100	± 100	+75	± 50
+125	± 100	+50	± 50	T/R white pitch link F(lb)	+125	± 125	+75	± 50
-200	± 100	-150	± 50	T/R pitch cont tube axial F(lb)	-200	± 125	-150	± 75
+10,000	± 10,000	+5000	± 15000	T/B vertical M ² (in-lb)	+10,000	± 10,000	+20,000	± 15,000
+65,000	± 10,000	+60,000	± 15,000	T/B lateral M ² (in-lb)	+80,000	± 5000	+80,000	± 10,000
+1400	± 300	+2000	± 600	Upper left fitting stress ² (psi)	+1800	± 200	+1800	± 300
-8000	± 5000	-6000	± 3000	T/F forward & aft M ³ (in-lb)	-5000	± 3000	-5500	± 3500
+15,000	± 2000	+12,000	± 1000	T/F lateral M ³ (in-lb)	+14,000	± 1000	+15,000	± 2000
+100	± 800	+300	± 800	T/R shaft parallel M(in-lb)	-400	± 700	-100	± 900
+100	± 800	+300	± 800	T/R shaft perp M(in-lb)	+500	± 500	+300	± 800
+0.5 R	± 0.5	1. L	± 1.	T/R blade pitch (deg)	0.5 R	± 0.5	1. L	± 0.5
+24,000	± 8000	+16,000	± 10,000	T/B torque ² (in-lb)	+18,000	± 4000	+18,000	± 8000
+40	±	+39	±	T/R shaft torque(ft-lb)	+40	±	+50	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 20
Left Sideward Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
				Gross weight(lb)		9260			
				Density altitude(ft)		2660			
				Air temperature(°C)		14.0			
				Main rotor speed(rpm)		326			
				Airspeed(KCAS)		40			
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±		±		T/R red pitch link F(lb)	±	+ 75	±	50	
±		±		T/R white pitch link F(lb)	±	+ 75	±	75	
±		±		T/R pitch cont tube axial F(lb)	±	-175	±	50	
±		±		T/B vertical M ² (in-lb)	±	+20,000	±	15000	
±		±		T/B lateral M ² (in-lb)	±	+95000	±	10000	
±		±		Upper left fitting stress ² (psi)	±	+2000	±	400	
±		±		T/F forward & aft M ³ (in-lb)	±	-8500	±	4500	
±		±		T/F lateral M ³ (in-lb)	±	+18000	±	1000	
±		±		T/R shaft parallel M(in-lb)	±	-100	±	800	
±		±		T/R shaft perp M(in-lb)	±	+300	±	800	
±		±		T/R blade pitch (deg)	±	+2.5 L	±	.5	
±		±		T/B torque ² (in-lb)	±	+22000	±	6000	
±		±		T/R shaft torque(ft-lb)	±	+70	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 21
Rearward Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
	7310		7600	Gross weight(lb)		9010		9190
	2150		3950	Density altitude(ft)		2630		2670
	9.0		22.0	Air temperature(°C)		12.0		14.5
	325		325	Main rotor speed(rpm)		327		327
	30		30	Airspeed(KCAS)		30		30
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 100	- 150	± 25	T/R red pitch link F(lb)	- 25	± 100	- 75	± 50
+ 50	± 100	- 150	± 50	T/R white pitch link F(lb)	- 50	± 100	- 75	± 50
- 75	± 50	- 50	± 50	T/R pitch cont tube axial F(lb)	+ 25	± 50	- 75	± 50
0	± 10000	+10,000	± 10,000	T/B vertical M ² (in-lb)	+10,000	± 10,000	+15,000	± 15,000
+35000	± 10000	+70,000	± 15,000	T/B lateral M ² (in-lb)	+70,000	± 5000	+70,000	± 15,000
+ 1300	± 300	+1800	± 300	Upper left fitting stress ² (psi)	+1900	± 200	+1600	± 800
- 4000	± 5000	-7500	± 3500	T/F forward & aft M ³ (in-lb)	-10,000	± 3500	-6500	± 3,000
+14000	± 2000	+15000	± 2000	T/F lateral M ³ (in-lb)	+17000	± 1000	+16,000	± 1000
+100	± 900	+ 200	± 1000	T/R shaft parallel M(in-lb)	- 300	± 700	- 100	± 1100
+100	± 500	+300	± 600	T/R shaft perp M(in-lb)	+400	± 500	+ 600	± 500
+ 3. L	± 0.5	+ 7. L	± 1.0	T/R blade pitch (deg)	+ 7. L	± 0.5	8. L	± 0.5
+20000	± 8000	+20,000	± 10,000	T/B torque ² (in-lb)	+20,000	± 6000	+24,000	± 6000
+80	±	+120	±	T/R shaft torque(ft-lb)	+ 150	±	+100	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 22
Normal Takeoff
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7830		7830		Gross weight(lb)	9440		9280	
1650		2500		Density altitude(ft)	1980		1990	
4.0		10.5		Air temperature(°C)	8.5		7.0	
324		321		Main rotor speed(rpm)	325		324	
~ 30		40		Airspeed(KCAS)	85		~ 30	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	±150	-100	± 50	T/R red pitch link F(lb)	+50 ± 175		-175	± 100
+25	±125	-75	± 50	T/R white pitch link F(lb)	+25 ± 225		-175	±100
+25	±100	-25	± 25	T/R pitch cont tube axial F(lb)	-50 ± 100		-25	± 50
+5000	±15000	+5000	±10000	T/B vertical M ² (in-lb)	-10000 ± 10000		+10000	±10000
+95000	±10000	+90000	± 5000	T/B lateral M ² (in-lb)	+95 000 ± 35000		+120000	±15000
+1800	± 400	+1900	± 300	Upper left fitting stress ² (psi)	+2600 ± 300		+2400	± 500
-6000	±4000	-6000	±4000	T/F forward & aft M ³ (in-lb)	-5000 ± 5000		-9500	± 5000
+17000	±3000	+17000	±1000	T/F lateral M ³ (in-lb)	+20000 ± 4000		+24000	± 3000
+200	± 600	+400	±1300	T/R shaft parallel M(in-lb)	0 ± 800		+300	± 1300
0	± 900	+400	± 800	T/R shaft perp M(in-lb)	+200 ± 1000		+400	± 1000
4.5 L	± 0.5	8.5 L	± 0.5	T/R blade pitch (deg)	5.0 L ± 0.5		11.5 L	± 0.5
+29000	±10000	+20000	±4000	T/B torque ² (in-lb)	+26000 ± 8000		+30000	± 8000
+200	±	+135	±	T/R shaft torque(ft-lb)	+100 ±		+245	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 23
Jump Takeoff
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212	
7670		7690		Gross weight(lb)	9240		9300	
1730		3780		Density altitude(ft)	2860		2540	
5.0		20.5		Air temperature(°C)	14.0		13.5	
316		313		Main rotor speed(rpm)	319		318	
HVR		HVR		Airspeed(KCAS)	HVR		HVR	
53		49		Engine torque(psi)	54		55	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-75	±125	-250	±25	T/R red pitch link F(lb)	-100 ± 100		-275	± 25
-75	±100	-225	±25	T/R white pitch link F(lb)	-150 ± 125		-250	± 25
+175	±100	-50	±50	T/R pitch cont tube axial F(lb)	+150 ± 50		+50	± 25
+15000 ± 10000		+20000 ± 10000		T/B vertical M ² (in-lb)	+20000 ± 5000		+30000 ± 5000	
+130000 ± 10000		+125000 ± 20000		T/B lateral M ² (in-lb)	+130000 ± 5000		+135000 ± 40000	
+2500 ± 200		+2500 ± 400		Upper left fitting stress ² (psi)	+2600 ± 200		+2800 ± 300	
-17000 ± 4500		-23000 ± 2000		T/F forward & aft M ³ (in-lb)	-21000 ± 3000		-18500 ± 2500	
+30000 ± 3000		+29000 ± 3000		T/F lateral M ³ (in-lb)	+29000 ± 2000		+31000 ± 2000	
0 ± 1000		+100 ± 800		T/R shaft parallel M(in-lb)	-400 ± 700		-500 ± 900	
-100 ± 600		+500 ± 1000		T/R shaft perp M(in-lb)	+300 ± 500		+300 ± 700	
15.0 L ± 0.5		15.0 L ± 0.5		T/R blade pitch (deg)	15.0 L ± 0.5		15.5 L ± 0.5	
+38000 ± 10000		40000 ± 10000		T/B torque ² (in-lb)	+35000 ± 5000		+48000 ± 8000	
+395 ±		400 ±		T/R shaft torque(ft-lb)	+465 ±		+445 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 24
Normal Landing
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
7230		7280		Gross weight (lb)		8590		8750	
1660		3590		Density altitude (ft)		3590		2000	
4.5		18.5		Air temperature (°C)		13.0		7.0	
321		320		Main rotor speed (rpm)		320		319	
~ 5		~ 5		Airspeed (KCAS)		~ 5		~ 5	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
- 50	± 100	-225	± 25	T/R red pitch link F(lb)		-75 ± 100		-200	± 25
-50	± 50	-200	± 25	T/R white pitch link F(lb)		-50 ± 50		-200	± 25
+175	± 125	-25	± 50	T/R pitch cont tube axial F(lb)		+125 ± 125		+50	± 50
+10000	± 10000	+10000	± 10000	T/B vertical M ² (in-lb)		+15000 ± 10000		+30000	± 5000
+60000	± 15000	+95000	± 15000	T/B lateral M ² (in-lb)		+95000 ± 10000		+110000	± 15000
+1300	± 300	+1600	± 300	Upper left fitting stress ² (psi)		+2000 ± 300		+1600	± 300
-26000	± 4000	-33500	± 4000	T/F forward & aft M ³ (in-lb)		-27500 ± 4000		-31000	± 2500
+21000	± 3000	+21000	± 2000	T/F lateral M ³ (in-lb)		+23000 ± 2000		+24000	± 2000
0	± 800	-300	± 800	T/R shaft parallel M (in-lb)		-100 ± 900		+200	± 800
-200	± 600	+300	± 500	T/R shaft perp M (in-lb)		+300 ± 1000		+300	± 600
10.5 L	± 0.5	11.5 L	± 0.5	T/R blade pitch (deg)		15.0 L ± 0.5		12.0 L	± 0.5
+22000	± 8000	+24000	± 8000	T/B torque ² (in-lb)		+26000 ± 6000		+24000	± 8000
+270	±	+250	±	T/R shaft torque (ft-lb)		+295 ±		+225	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 25
IGE Forward Flight Acceleration
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7640		7570		Gross weight(lb)	9190		9150	
1540		3620		Density altitude(ft)	2110		2760	
4.5		19.5		Air temperature(°C)	8.0		15.0	
322		321		Main rotor speed(rpm)	323		324	
HVR to 106		HVR to 106		Airspeed(KCAS)	HVR to 106		HVR to 106	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	± 175	-75	± 75	T/R red pitch link F(lb)	+50 ± 175		+25	± 100
+50	± 175	-50	± 100	T/R white pitch link F(lb)	0 ± 175		-25	± 100
-50	± 100	-125	± 75	T/R pitch cont tube axial F(lb)	-100 ± 100		-150	± 75
-20000	± 10000	-5000	± 15000	T/B vertical M ² (in-lb)	-10000 ± 10000		+5000	± 15000
+130000	± 15000	+120000	± 35000	T/B lateral M ² (in-lb)	+125000 ± 15000		+125000	± 25000
+3000	± 300	+3300	± 600	Upper left fitting stress ² (psi)	+3200 ± 200		+3000	± 400
-10000	± 5000	-10500	± 5500	T/F forward & aft M ³ (in-lb)	-7000 ± 4000		-10500	± 5000
+26000	± 3000	+25000	± 4000	T/F lateral M ³ (in-lb)	+26000 ± 2000		+24000	± 3000
+100	± 900	+400	± 1200	T/R shaft parallel M(in-lb)	-300 ± 800		0	± 1300
0	± 900	+400	± 1500	T/R shaft perp M(in-lb)	+400 ± 900		+400	± 1300
6.0 L	± 0.5	6.0 L	± 0.5	T/R blade pitch (deg)	6.0 L ± 0.5		6.0 L	± 0.5
+36000	± 10000	+22000	± 10000	T/B torque ² (in-lb)	+30000 ± 6000		+34000	± 10000
+90	±	+90	±	T/R shaft torque(ft-lb)	+90 ±		+90	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 26
IGE Forward Flight Deceleration
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7640		7560		Gross weight(lb)	9190		9140		
1540		3750		Density altitude(ft)	2720		2760		
4.5		19.5		Air temperature(°C)	12.5		15.0		
320		321		Main rotor speed(rpm)	324		332		
106 to HVR		106 to HVR		Airspeed(KCAS)	106 to HVR		106 to HVR		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
-75	± 100	-200	± 25	T/R red pitch link F(lb)	-100 ± 50		-175 ± 50		
-100	± 100	-175	± 25	T/R white pitch link F(lb)	-150 ± 50		-175 ± 75		
+125	± 100	0	± 50	T/R pitch cont tube axial F(lb)	+150 ± 50		0 ± 50		
+10000	± 15000	+15000	± 10000	T/B vertical M ² (in-lb)	+10000 ± 5000		+20000 ± 15000		
+80000	± 10000	+90000	± 10000	T/B lateral M ² (in-lb)	+115000 ± 5000		+100000 ± 15000		
+1800	± 300	+1700	± 200	Upper left fitting stress ² (psi)	+2500 ± 200		+1500 ± 300		
-19000	± 3500	-28500	± 2500	T/F forward & aft M ³ (in-lb)	-24000 ± 5000		-16000 ± 5000		
+16000	± 3000	+21000	± 2000	T/F lateral M ³ (in-lb)	+26000 ± 2000		+20000 ± 3000		
+400	± 600	+300	± 700	T/R shaft parallel M(in-lb)	-400 ± 600		0 ± 1100		
-300	± 600	+400	± 700	T/R shaft perp M(in-lb)	+400 ± 500		+400 ± 1100		
8.5 L	± 0.5	11.0 L	± 0.5	T/R blade pitch (deg)	13.0 L ± 0.5		11.0 L ± 0.5		
+20000	± 6000	+26000	± 10000	T/B torque ² (in-lb)	+36000 ± 6000		+28000 ± 6000		
+180	±	+235	±	T/R shaft torque(ft-lb)	+350 ±		+340 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

Instrumentation located at tail fin station 41.0

FIGURE 27
IGE Quick Stop
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	FOG CONFIGURATION ²			
801		212			801		212	
7580		7500		Gross weight (lb)	9130		9100	
1790		3700		Density altitude (ft)	2350		2750	
6.0		20.0		Air temperature (°C)	9.5		14.5	
322		319		Main rotor speed (rpm)	322		330	
106 to HVR		106 to HVR		Airspeed (KCAS)	106 to HVR		106 to HVR	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-75	± 50	-100	± 25	T/R red pitch link F(lb)	-75	± 50	0	± 25
-50	± 50	-75	± 25	T/R white pitch link F(lb)	-125	± 75	0	± 50
+150	± 75	-50	± 50	T/R pitch cont tube axial F(lb)	+150	± 50	-125	± 50
+15000	± 10000	0	± 20000	T/B vertical M ² (in-lb)	+10000	± 5000	-5000	± 15000
+115000	± 10000	+55000	± 10000	T/B lateral M ² (in-lb)	+110000	± 5000	+95000	± 20000
+1900	± 300	+1000	± 400	Upper left fitting stress ² (psi)	+2300	± 200	+1800	± 300
-26000	± 4000	-30000	± 4000	T/F forward & aft M ³ (in-lb)	-23500	± 2500	-16500	± 6500
+27000	± 2000	+24000	± 2000	T/F lateral M ³ (in-lb)	+27000	± 2000	+21000	± 2000
0	± 600	+100	± 800	T/R shaft parallel M (in-lb)	-400	± 700	-100	± 1200
0	± 600	+300	± 700	T/R shaft perp M (in-lb)	+500	± 600	+400	± 1100
13.0L	± 0.5	13.5L	± 0.5	T/R blade pitch (deg)	13.5L	± 0.5	12.0L	± 0.5
+28000	± 10000	+30000	± 10000	T/B torque ² (in-lb)	+36000	± 4000	+28000	± 10000
+340	±	+350	±	T/R shaft torque (ft-lb)	+340	±	+400	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 28
Level Flight Acceleration
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7780		7780		Gross weight(lb)	9340		8930		
3840		4080		Density altitude(ft)	4180		3870		
2.0		15.5		Air temperature(°C)	6.5		12.0		
321		321		Main rotor speed(rpm)	323		323		
145		145		Airspeed(KCAS)	133		129		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
+25	±200	-100	±75	T/R red pitch link F(lb)	0	±200	-25	±50	
+50	±175	-50	±100	T/R white pitch link F(lb)	0	±125	-25	±100	
0	±250	-100	±100	T/R pitch cont tube axial F(lb)	-50	±200	-100	±100	
-15000	±30000	-15000	±30000	T/B vertical M ² (in-lb)	-10000	±30000	-5000	±15000	
+130000	±45000	+140000	±45000	T/B lateral M ² (in-lb)	+125000	±20000	+143000	±25000	
+3100	±700	+3300	±600	Upper left fitting stress ² (psi)	+3100	±500	+3200	±500	
-23000	±9000	-27000	±5500	T/F forward & aft M ³ (in-lb)	-24000	±7000	-24500	±5500	
+26000	±8000	+25000	±5000	T/F lateral M ³ (in-lb)	+27000	±4000	+27000	±4000	
+200	±1300	-100	±1600	T/R shaft parallel M(in-lb)	0	±1200	+400	±1200	
0	±1200	+200	±1400	T/R shaft perp M(in-lb)	+200	±1200	+400	±1300	
4.5 L	±0.5	4.5 L	±0.5	T/R blade pitch (deg)	6.0 L	±0.5	3.5 L	±0.5	
+26000	±12000	+26000	±8000	T/B torque ² (in-lb)	+26000	±10000	+30000	±10000	
+100	±	+75	±	T/R shaft torque(ft-lb)	+95	±	+70	±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 29
Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7780		7560		Gross weight(lb)	9340		9090	
3840		4200		Density altitude(ft)	4180		4000	
2.0		3.0		Air temperature(°C)	6.5		12.0	
321		323		Main rotor speed(rpm)	323		322	
145		148		Airspeed(KCAS)	133		133	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	±200	-75	±50	T/R red pitch link F(lb)	0	±200	-50	±75
+50	±175	-50	±50	T/R white pitch link F(lb)	0	±125	-25	±100
0	±250	-175	±50	T/R pitch cont tube axial F(lb)	-50	±200	-100	±100
-15000	±30000	-5000	±25000	T/B vertical M ² (in-lb)	-10000	±30000	-5000	±15000
+130000	±45000	+126000	±45000	T/B lateral M ² (in-lb)	+125000	±20000	+140000	±30000
+3100	±700	+3800	±600	Upper left fitting stress ² (psi)	+3100	±500	+3000	±600
-23000	±9000	-23500	±4500	T/F forward & aft M ³ (in-lb)	-24000	±7000	-25500	±5000
+26000	±8000	+28000	±3000	T/F lateral M ³ (in-lb)	+27000	±4000	+25000	±4000
+200	±1300	+500	±600	T/R shaft parallel M(in-lb)	0	±1200	+200	±1400
0	±1200	+200	±400	T/R shaft perp M(in-lb)	+200	±1200	+300	±1400
4.5 L	± 0.5	6.0 L	± 0.5	T/R blade pitch (deg)	6.0 L	± 0.5	4.0 L	± 0.5
+26000	±12000	+38000	±6000	T/B torque ² (in-lb)	+26000	±10000	+26000	±10000
+100	±	+80	±	T/R shaft torque(ft-lb)	+95	±	+80	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 30
Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
212		212			212		212	
7720		7690		Gross weight (lb)	9200		9180	
4130		3990		Density altitude (ft)	4010		3900	
3.5		4.0		Air temperature (°C)	11.5		12.0	
324		324		Main rotor speed (rpm)	324		324	
80		90		Airspeed (KCAS)	80		90	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	± 25	0	± 25	T/R red pitch link F(lb)	0	± 25	0	± 25
0	± 25	0	± 25	T/R white pitch link F(lb)	0	± 50	0	± 50
-75	± 25	-100	± 25	T/R pitch cont tube axial F(lb)	-100	± 50	-100	± 50
-15000	± 5000	-10000	± 10000	T/B vertical M ² (in-lb)	0	± 10000	0	± 10000
+50000	± 10000	+50000	± 10000	T/B lateral M ² (in-lb)	+80000	± 10000	+70000	± 10000
+1900	± 200	+2100	± 200	Upper left fitting stress ² (psi)	+1500	± 400	+1300	± 400
-22500	± 3000	-26000	± 3500	T/F forward & aft M ³ (in-lb)	-27000	± 4500	-29000	± 4500
+12000	± 1000	+13000	± 1000	T/F lateral M ³ (in-lb)	+14000	± 3000	+18000	± 3000
+300	± 500	+300	± 600	T/R shaft parallel M(in-lb)	+300	± 900	+200	± 1000
+100	± 500	+200	± 500	T/R shaft perp M(in-lb)	+100	± 1000	+400	± 1100
3.0 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	1.5 L	± 0.5	1.5 L	± 0.5
+20000	± 6000	+22000	± 6000	T/B torque ² (in-lb)	+12000	± 8000	+10000	± 8000
+50	±	+50	±	T/R shaft torque(ft-lb)	+50	±	+55	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 31
Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
212		212			212		212	
7670		7620		Gross weight(lb)	9150		9130	
4040		4000		Density altitude(ft)	3970		4020	
3.5		3.0		Air temperature(°C)	11.5		11.5	
324		323		Main rotor speed(rpm)	323		323	
100		111		Airspeed(KCAS)	101		110	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	± 25	-25	± 25	T/R red pitch link F(lb)	0	± 25	0	± 50
0	± 25	+25	± 25	T/R white pitch link F(lb)	0	± 50	0	± 75
-100	± 25	-75	± 25	T/R pitch cont tube axial F(lb)	-100	± 50	-100	± 75
-75000	± 10000	-75000	± 10000	T/B vertical M ² (in-lb)	0	± 10000	-5000	± 20000
+60000	± 15000	+45000	± 10000	T/B lateral M ² (in-lb)	+80000	± 10000	+95000	± 15000
+1700	± 200	+2800	± 300	Upper left fitting stress ² (psi)	+1500	± 400	+2000	± 400
-26000	± 3000	-24000	± 4500	T/F forward & aft M ³ (in-lb)	-28000	± 5000	-23000	± 6000
+16000	± 1000	+16000	± 1000	T/F lateral M ³ (in-lb)	+14000	± 3000	+17000	± 3000
+300	± 600	+300	± 600	T/R shaft parallel M(in-lb)	+200	± 1000	+200	± 1000
+100	± 500	+100	± 600	T/R shaft perp M(in-lb)	+400	± 1300	+300	± 1200
3.0 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	2.0 L	± 0.5	2.0 L	± 0.5
+24000	± 8000	+28000	± 6000	T/B torque ² (in-lb)	+16000	± 8000	+16000	± 10000
+50	±	+50	±	T/R shaft torque(ft-lb)	+60	±	+55	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 32
Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
212		212			212		212	
7600		7580		Gross weight(lb)	9110		9090	
3970		4000		Density altitude(ft)	4090		4000	
29.5		3.0		Air temperature(°C)	12.0		12.0	
324		324		Main rotor speed(rpm)	324		322	
119		130		Airspeed(KCAS)	120		133	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	± 25	-25	± 25	T/R red pitch link F(lb)	-25 ± 50		-50	± 75
0	± 25	0	± 25	T/R white pitch link F(lb)	-25 ± 75		-25	± 100
-75	± 50	-75	± 50	T/R pitch cont tube axial F(lb)	-100 ± 100		-100	± 100
0	± 10000	-10000	± 15000	T/B vertical M ² (in-lb)	-5000 ± 15000		-5000	± 15000
+80000	± 10000	+90000	± 20000	T/B lateral M ² (in-lb)	+115000 ± 20000		+140000	± 30000
+2000	± 200	+2500	± 500	Upper left fitting stress ² (psi)	+2500 ± 400		+3000	± 600
-20000	± 4000	-17000	± 4000	T/F forward & aft M ³ (in-lb)	-20500 ± 4500		-25500	± 5000
+21000	± 1000	+22000	± 1000	T/F lateral M ³ (in-lb)	+20000 ± 3000		+25000	± 4000
+300	± 500	+300	± 600	T/R shaft parallel M(in-lb)	+300 ± 1000		+200	± 1400
+100	± 500	+100	± 600	T/R shaft perp M(in-lb)	+400 ± 1300		+300	± 1400
3.5 L	± 0.5	4.0 L	± 0.5	T/R blade pitch (deg)	3.0 L ± 0.5		4.0 L	± 0.5
+26000	± 4000	+28000	± 6000	T/B torque ² (in-lb)	+22000 ± 10000		+26000	± 10000
+60	±	+60	±	T/R shaft torque(ft-lb)	+55 ±		+80	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 33
Maximum Power Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
		7490		Gross weight(lb)				9280	
		4900		Density altitude(ft)				4670	
		18.0		Air temperature(°C)				11.0	
		324		Main rotor speed(rpm)				324	
		70		Airspeed(KCAS)				70	
				Rate of climb(fpm)				1733	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
±		-75	± 50	T/R red pitch link F(lb)		±		-100	± 50
±		-50	± 50	T/R white pitch link F(lb)		±		-75	± 50
±		-100	± 75	T/R pitch cont tube axial F(lb)		±		-150	± 50
±		0	±10000	T/B vertical M ² (in-lb)		±		-5000	±10000
±		+50000	±5000	T/B lateral M ² (in-lb)		±		+130000	±10000
±		+3100	± 400	Upper left fitting stress ² (psi)		±		+3400	± 200
±		-20500	±5000	T/F forward & aft M ³ (in-lb)		±		-23000	± 5500
±		+23000	±3000	T/F lateral M ³ (in-lb)		±		+25000	± 2000
±		-200	±1300	T/R shaft parallel M(in-lb)		±		+300	± 1000
±		+200	±1000	T/R shaft perp M(in-lb)		±		+700	± 1000
±		4.5 L	± 0.5	T/R blade pitch (deg)		±		5.5 L	± 0.5
±		+24000	±8000	T/B torque ² (in-lb)		±		+32000	± 6000
±		+70	±	T/R shaft torque(ft-lb)		±		+80	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 34
Maximum Power Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801	212				801	212		
7580	7580			Gross weight(lb)	9210	9390		
4730	5300			Density altitude(ft)	4500	4180		
3.5	15.0			Air temperature(°C)	6.0	14.0		
319	320			Main rotor speed(rpm)	320	323		
117	120			Airspeed(KCAS)	121	107		
1300	1300			Rate of climb(fpm)	1300	1300		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±200	-75	±75	T/R red pitch link F(lb)	0	±150	-200	±100
+50	±200	-50	±75	T/R white pitch link F(lb)	+50	±150	-150	±100
-50	±100	-125	±100	T/R pitch cont tube axial F(lb)	-100	±100	-125	±75
-15000	±15000	-5000	±10000	T/B vertical M ² (in-lb)	-10000	±20000	-5000	±10000
+135000	±20000	+55000	±10000	T/B lateral M ² (in-lb)	+100000	±20000	+105000	±20000
+3200	±500	+3200	±300	Upper left fitting stress ² (psi)	+3300	±400	+2700	±300
-24000	±6000	-26000	±4500	T/F forward & aft M ³ (in-lb)	-25000	±6000	-24000	±6500
+28000	±4000	+26000	±4000	T/F lateral M ³ (in-lb)	+28000	±3000	+23000	±3000
+200	±1000	-100	±1400	T/R shaft parallel M(in-lb)	+100	±1100	+600	±1200
-200	±1000	+200	±1200	T/R shaft perp M(in-lb)	0	±1000	+200	±1700
4.0 L	±0.5	4.0 L	±0.5	T/R blade pitch (deg)	4.5 L	±0.5	9.0 L	±0.5
+30000	±10000	+20000	±8000	T/B torque ² (in-lb)	+34000	±8000	+28000	±8000
+70	±	+50	±	T/R shaft torque(ft-lb)	+60	±	+165	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 35
Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7480		7700		Gross weight (lb)			8900	
4410		5490		Density altitude (ft)			3620	
8.0		15.0		Air temperature (°C)			11.0	
324		324		Main rotor speed (rpm)			324	
71		73		Airspeed (KCAS)			70	
800		1100		Rate of climb (fpm)			1000	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±100	-25	±50	T/R red pitch link F(lb)	±		0	±75
+125	±100	-25	±50	T/R white pitch link F(lb)	±		25	±50
-100	±125	-125	±50	T/R pitch cont tube axial F(lb)	±		-100	±50
-10000	±15000	-5000	±10000	T/B vertical M ² (in-lb)	±		0	±10000
+70000	±10000	+35000	±5000	T/B lateral M ² (in-lb)	±		+102000	±5000
+1600	±400	+2100	±300	Upper left fitting stress ² (psi)	±		+2100	±300
-22000	±4500	-23500	±8000	T/F forward & aft M ³ (in-lb)	±		-24500	±4500
+14000	±2000	+26000	±2000	T/F lateral M ³ (in-lb)	±		+19000	±2000
0	±800	-200	±900	T/R shaft parallel M (in-lb)	±		+400	±1100
+200	±900	+200	±1000	T/R shaft perp M (in-lb)	±		+200	±1100
0.5 L	±0.5	3.0 L	±0.5	T/R blade pitch (deg)	±		2.5 L	±0.5
+14000	±8000	+16000	±6000	T/B torque ² (in-lb)	±		+26000	±8000
+50	±	+55	±	T/R shaft torque (ft-lb)	±		+60	±

¹ Average longitudinal CG at fuselage station 195.7

² Instrumentation located at tail boom station 50.0

³ Instrumentation located at tail fin station 41.0

FIGURE 36
Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7580		7650		Gross weight (lb)	9210		8820	
4730		5060		Density altitude(ft)	4500		3730	
3.5		15.0		Air temperature(°C)	6.0		11.5	
319		324		Main rotor speed(rpm)	320		323	
117		120		Airspeed(KCAS)	121		120	
1300		1200		Rate of climb(fpm)	1300		1300	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±200	0	±50	T/R red pitch link F(lb)	0	±150	-25	±50
+50	±200	-50	±75	T/R white pitch link F(lb)	+50	±150	0	±75
-50	±100	-125	±75	T/R pitch cont tube axial F(lb)	-100	±100	-125	±75
-15000	±15000	0	±15000	T/B vertical M ² (in-lb)	-10000	±20000	-5000	±15000
+135000	±20000	+150000	±10000	T/B lateral M ² (in-lb)	+100000	±20000	+140000	±20000
+3200	±500	+3000	±300	Upper left fitting stress ² (psi)	+3300	±400	+3300	±500
-24000	±6000	-21000	±5000	T/F forward & aft M ³ (in-lb)	-25000	±6000	-24500	±5500
+28000	±4000	+24000	±4000	T/F lateral M ³ (in-lb)	+28000	±3000	+26000	±5000
+200	±1000	-200	±1100	T/R shaft parallel M(in-lb)	+100	±1100	+300	±1100
-200	±1000	+300	±900	T/R shaft perp M(in-lb)	0	±1000	+400	±1400
4.0 L	± 0.5	3.2 L	± 0.5	T/R blade pitch (deg)	4.5 L	± 0.5	3.5 L	± 0.5
+30000	±10000	+26000	±8000	T/B torque ² (in-lb)	+34000	±8000	+34000	±8000
+70	±	+60	±	T/R shaft torque(ft-lb)	+60	±	+40	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 37
Partial Power Descents
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7750		7720		Cross weight (lb)	9290		8850	
4950		4490		Density altitude (ft)	4540		3880	
6.0		15.5		Air temperature (°C)	5.5		11.5	
323		325		Main rotor speed (rpm)	327		323	
128		128		Airspeed (KCAS)	113		120	
-600		-500		Rate of climb (fpm)	-600		-500	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±100	0	±50	T/R red pitch link F(lb)	+75	±100	-50	±50
+125	±100	0	±50	T/R white pitch link F(lb)	+125	±50	-75	±50
-100	±100	-100	±50	T/R pitch cont tube axial F(lb)	±		-250	±75
-5000	±20000	-5000	±50000	T/B vertical M ² (in-lb)	-10000	±25000	-25000	±15000
+75000	±20000	+55000	±20000	T/B lateral M ² (in-lb)	+40000	±15000	+150000	±15000
+1500	±400	+1800	±400	Upper left fitting stress ² (psi)	+1100	±400	+2400	±300
-23500	±8000	-25500	±6000	T/F forward & aft M ³ (in-lb)	-27500	±7500	-23000	±5000
+11000	±3000	+10000	±3000	T/F lateral M ³ (in-lb)	+10000	±3000	+13000	±3000
0	±1000	0	±1300	T/R shaft parallel M (in-lb)	0	±900	+200	±1100
+200	±700	+200	±1000	T/R shaft perp M (in-lb)	+200	±800	+200	±1100
0.5 R ± 0.5		1.0 L ± 0.5		T/R blade pitch (deg)	1.0 L ± 0.5		1.0 L ± 0.5	
+6000	±9000	+14000	±8000	T/B torque ³ (in-lb)	+10000	±10000	+8000	±8000
+50	±	+50	±	T/R shaft torque (ft-lb)	+55	±	+55	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 38
Partial Power Descents
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
7700		7670		Gross weight(lb)		9040		8790	
4200		4780		Density altitude(ft)		3870		4020	
7.5		19.0		Air temperature(°C)		7.5		11.5	
326		334		Main rotor speed(rpm)		324		325	
129		128		Airspeed(KCAS)		113		120	
-1200		-1100		Rate of climb(fpm)		-1100		-1100	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
+50 ± 100		-25 ± 50		T/R red pitch link F(lb)		+75 ± 75		0 ± 50	
+100 ± 100		-25 ± 50		T/R white pitch link F(lb)		+100 ± 50		+25 ± 50	
-100 ± 100		-75 ± 75		T/R pitch cont tube axial F(lb)		±		-100 ± 75	
-5000 ± 20000		-5000 ± 20000		T/B vertical M ² (in-lb)		-10000 ± 10000		-5000 ± 15000	
+45000 ± 10000		+25000 ± 10000		T/B lateral M ² (in-lb)		+50000 ± 10000		+55000 ± 15000	
+900 ± 400		+1200 ± 500		Upper left fitting stress ² (psi)		+900 ± 500		+1000 ± 500	
-20000 ± 7000		-24500 ± 7000		T/F forward & aft M ³ (in-lb)		-20000 ± 7000		-22000 ± 6000	
+5000 ± 3000		+7000 ± 4000		T/F lateral M ³ (in-lb)		+5000 ± 3000		+7000 ± 4000	
0 ± 800		-200 ± 1300		T/R shaft parallel M(in-lb)		0 ± 800		+200 ± 1000	
+100 ± 800		+100 ± 1100		T/R shaft perp M(in-lb)		+300 ± 900		+300 ± 1200	
1.5 R ± 0.5		1.0 L ± 0.5		T/R blade pitch (deg)		0 ± 0.5		0.5 L ± 0.5	
+4000 ± 10000		6000 ± 6000		T/B torque ² (in-lb)		+10000 ± 10000		8000 ± 8000	
+50 ±		+50 ±		T/R shaft torque(ft-lb)		+50 ±		+50 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 39
Left Sideslip in Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7550		7740		Gross weight(lb)	9180		9030	
3650		3670		Density altitude(ft)	3640		3460	
3.5		15.5		Air temperature(°C)	10.5		13.0	
324		324		Main rotor speed(rpm)	324		324	
126		121		Airspeed(KCAS)	118		120	
14		14		Sideslip angle(deg)	16		15	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+250	±250	+275	±150	T/R red pitch link F(lb)	+250	±250	+225	±150
+250	±250	+300	±175	T/R white pitch link F(lb)	+275	±275	+250	±150
-300	±225	-225	±175	T/R pitch cont tube axial F(lb)	-325	±300	-275	±175
+10000	±20000	+20000	±20000	T/B vertical M ² (in-lb)	+25000	±15000	+25000	±20000
+145000	±20000	+140000	±25000	T/B lateral M ² (in-lb)	+170000	±20000	+165000	±15000
+3000	±400	+2700	±400	Upper left fitting stress ² (psi)	+3500	±400	+3600	±400
-10000	±8000	-9000	±6000	T/F forward & aft M ³ (in-lb)	-7000	±6500	-7000	±7000
+16000	±4000	+16000	±4000	T/F lateral M ³ (in-lb)	+22000	±4000	+21000	±5000
0	±1400	+600	±1500	T/R shaft parallel M(in-lb)	0	±1300	+500	±1400
+100	±1200	+300	±1700	T/R shaft perp M(in-lb)	+300	±2300	+200	±1700
9.5 R ± 0.5		7.5 R ± 0.5		T/R blade pitch (deg)	5.0 R ± 0.5		6.0 R ± 0.5	
+26000	±10000	+16000	±12000	T/B torque ² (in-lb)	+22000	±8000	+30000	±10000
+80	±	+85	±	T/R shaft torque(ft-lb)	+35	±	+50	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 40
Left Sideslip in Level Flight
AH-1C S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7520		7790		Gross weight(lb)	8830		9070	
3930		3700		Density altitude(ft)	3800		3750	
8.5		16.5		Air temperature(°C)	7.5		14.0	
326		325		Main rotor speed(rpm)	325		324	
70		71		Airspeed(KCAS)	69		70	
22		22		Sideslip angle(deg)	23		22	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+150	±200	+200	±75	T/R red pitch link F(lb)	+175	±200	+175	±75
+200	±200	+200	±100	T/R white pitch link F(lb)	+200	±100	+200	±75
-275	±100	-225	±100	T/R pitch cont tube axial F(lb)	-250	±150	-325	±100
+10000	±15000	+20000	±10000	T/B vertical M ² (in-lb)	+10000	±20000	+15000	±10000
+75000	±10000	+50000	±20000	T/B lateral M ² (in-lb)	+75000	±45000	+80000	±5000
+1000	±500	+800	±200	Upper left fitting stress ² (psi)	+1300	±400	+1700	±300
-9500	±5500	-6500	±5000	T/F forward & aft M ³ (in-lb)	-1000	±6000	-5000	±6000
+11000	±2000	+14000	±10000	T/F lateral M ³ (in-lb)	+14000	±3000	+13000	±2000
0	±900	+500	±1200	T/R shaft parallel M(in-lb)	-100	±900	+500	±1100
+300	±900	+200	±1000	T/R shaft perp M(in-lb)	+300	±900	-100	±1200
7.5 R	±0.5	5.0 R	±0.5	T/R blade pitch (deg)	5.5 R	±0.5	4.0 R	±0.5
+4000	±6000	+2000	±8000	T/B torque ² (in-lb)	+12000	±8000	+16000	±6000
+35	±	+35	±	T/R shaft torque(ft-lb)	+30	±	+25	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 41
Right Sideslip in Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7350		7730		Gross weight(lb)	9160		9020	
4080		4050		Density altitude(ft)	3740		3980	
7.5		17.5		Air temperature(°C)	10.0		14.0	
320		324		Main rotor speed(rpm)	323		325	
120		121		Airspeed(KCAS)	120		120	
15		15		Sideslip angle(deg)	15		14	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-125	±250	-325	±125	T/R red pitch link F(lb)	-125	±250	-350	±125
-75	±175	-250	±100	T/R white pitch link F(lb)	-100	±225	-275	±125
+200	±150	-25	±75	T/R pitch cont tube axial F(lb)	+175	±150	+25	±100
-15000	±15000	-15000	±20000	T/B vertical M ² (in-lb)	-5000	±15000	-5000	±10000
+85000	±15000	+40000	±20000	T/B lateral M ² (in-lb)	+70000	±20000	+60000	±15000
+1800	±400	+1000	±400	Upper left fitting stress ² (psi)	+1200	±400	+1500	±300
-14000	±7000	-8000	±6000	T/F forward & aft M ³ (in-lb)	-9500	±6500	-19000	±5000
+23000	±3000	+15000	±4000	T/F lateral M ³ (in-lb)	+20000	±4000	+17000	±3000
-100	±1000	+400	±1000	T/R shaft parallel M(in-lb)	-200	±1000	+400	±1100
+200	±1000	+200	±1200	T/R shaft perp M(in-lb)	+300	±2000	+300	±1000
15.0 L	±0.5	10.0 L	±0.5	T/R blade pitch (deg)	14.5 L	±0.5	10.0 L	±0.5
+16000	±8000	+10000	±12000	T/B torque ² (in-lb)	+16000	±8000	+16000	±6000
+315	±	+205	±	T/R shaft torque(ft-lb)	+270	±	+260	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 42
Right Sideslip in Level Flight
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801	212				801	212		
7500	7780			Gross weight(lb)	8800	9060		
3630	3920			Density altitude(ft)	4300	3930		
8.0	16.0			Air temperature(°C)	6.5	15.0		
325	324			Main rotor speed(rpm)	323	324		
73	71			Airspeed(KCAS)	68	68		
22	22			Sideslip angle(deg)	23	20		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-100	±150	-250	±75	T/R red pitch link F(lb)	-100	±175	-250	±75
-75	±150	-225	±50	T/R white pitch link F(lb)	-100	±100	-200	±25
+175	±100	+75	±50	T/R pitch cont tube axial F(lb)	+175	±100	0	±50
-5000	±15000	+5000	±10000	T/B vertical M ² (in-lb)	-5000	±15000	+5000	±10000
+25000	±10000	+40000	±10000	T/B lateral M ² (in-lb)	+35000	±10000	+80000	±15000
+200	±400	+400	±200	Upper left fitting stress ² (psi)	+600	±200	+1600	±200
-4500	±4000	-6500	±4000	I/F forward & aft M ³ (in-lb)	-3000	±4000	-2000	±4000
+8000	±2000	+12000	±2000	T/F lateral M ³ (in-lb)	+12000	±3000	+14000	±2000
0	±800	+400	±800	T/R shaft parallel M(in-lb)	0	±800	+500	±900
+200	±800	+300	±1000	T/R shaft perp M(in-lb)	+200	±800	+300	±1000
7.5 L	±0.5	10.0 L	±0.5	T/R blade pitch (deg)	9.5 L	±0.5	10.5 L	±0.5
+4000	±8000	+8000	±8000	T/B torque ² (in-lb)	+8000	±8000	+12000	±8000
+135	±	+160	±	T/R shaft torque(ft-lb)	+170	±	+170	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 43
Left Sideslip in Climb
AH-1G S/N 71-20385

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7470		7500		Gross weight(lb)			8840	
3690		4920		Density altitude(ft)			4040	
4.5		17.5		Air temperature(°C)			14.0	
322		324		Main rotor speed(rpm)			325	
120		121		Airspeed(KCAS)			118	
1200		1000		Rate of climb(fpm)			1000	
13		13		Sideslip angle(deg)			13	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+200	± 250	+200	± 125	T/R red pitch link F(lb)	±		+200	± 100
+200	± 225		±	T/R white pitch link F(lb)	±		+225	± 130
-350	± 250	-250	± 175	T/R pitch cont tube axial F(lb)	±		-300	± 150
+15000	± 15000	+15000	± 15000	T/B vertical M ² (in-lb)	±		+20000	± 15000
+175000	± 25000	+165000	± 25000	T/B lateral M ² (in-lb)	±		+165000	± 20000
+3800	± 400	+3700	± 600	Upper left fitting stress ² (psi)	±		+3900	± 600
-8000	± 8000	-13000	± 7000	T/F forward & aft M ³ (in-lb)	±		-6000	± 8000
+24000	± 6000	+21000	± 5000	T/F lateral M ³ (in-lb)	±		+24000	± 6000
+100	± 1100	+500	± 1500	T/R shaft parallel M(in-lb)	±		+400	± 1600
0	± 1000	0	± 1500	T/R shaft perp M(in-lb)	±		0	± 1500
7.5 R	± 0.5	6.5 R	± 0.5	T/R blade pitch (deg)	±		4.5 R	± 0.5
+34000	± 10000	+24000	± 10000	T/B torque ² (in-lb)	±		+36000	± 10000
+40	±	+60	±	T/R shaft torque(ft-lb)	±		+50	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 44
Left Sideslip in Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7430		7650		Gross weight(lb)	9300		8940	
4770		4640		Density altitude(ft)	4900		3770	
7.0		17.5		Air temperature(°C)	9.0		14.0	
324		325		Main rotor speed(rpm)	323		323	
69		71		Airspeed(KCAS)	73		69	
850		1000		Rate of climb(fpm)	1000		900	
22		21		Sideslip angle(deg)	23		24	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+150	±175	+225	±100	T/R red pitch link F(lb)	+225 ± 200		+175	± 75
+175	±175	+200	±100	T/R white pitch link F(lb)	+200 ± 200		+200	±100
-350	±125	-275	±125	T/R pitch cont tube axial F(lb)	-300 ± 200		-375	±100
+15000	±15000	+15000	±15000	T/B vertical M ² (in-lb)	+20000 ± 15000		+10000	±10000
+105000	±10000	+110000	±10000	T/B lateral M ² (in-lb)	+150000 ± 15000		+125000	±15000
+2000	±400	+2200	±400	Upper left fitting stress ² (psi)	+3200 ± 500		+2700	± 500
-2500	±3500	-11000	±4500	T/F forward & aft M ³ (in-lb)	-3500 ± 3500		-6500	± 5500
+15000	±2000	+17000	±3000	T/F lateral M ³ (in-lb)	+24000 ± 3000		+21000	± 4000
0	±1000	+400	±1200	T/R shaft parallel M(in-lb)	-200 ± 900		+400	±1400
+200	±900	+200	±1000	T/R shaft perp M(in-lb)	+300 ± 1400		+200	±1300
6.0 R	± 0.5	4.5 R	± 0.5	T/R blade pitch (deg)	4.0 R ± 0.5		3.0 R	± 0.5
+6000	±8000	+14000	±11000	T/B torque ² (in-lb)	+20000 ± 6000		+26000	±8000
+30	±	+20	±	T/R shaft torque(ft-lb)	-5 ±		-5	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 45
Right Sideslip in Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7440		7420		Gross weight(lb)			8770	
4600		4490		Density altitude(ft)			3740	
5.5		17.5		Air temperature(°C)			14.0	
320		324		Main rotor speed(rpm)			322	
117		120		Airspeed(KCAS)			119	
1000		1000		Rate of climb(fpm)			800	
13		14		Sideslip angle(deg)			12	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-100	± 175	-375	± 125	T/R red pitch link F(lb)	±		-325	± 150
-50	± 150		±	T/R white pitch link F(lb)	±		-275	± 125
+75	± 175	+75	± 100	T/R pitch cont tube axial F(lb)	±			±
-20000	± 15000	-5000	± 35000	T/B vertical M ² (in-lb)	±		-10000	± 20000
+80000	± 25000	+70000	± 40000	T/B lateral M ² (in-lb)	±		+75000	± 20000
+2000	± 400	+1700	± 400	Upper left fitting stress ² (psi)	±		+2200	± 400
-8000	± 12000	-11000	± 6500	T/F forward & aft M ³ (in-lb)	±		-7500	± 7500
+24000	± 4000	+21000	± 5000	T/F lateral M ³ (in-lb)	±		+24000	± 6000
0	± 1000	+400	± 1000	T/R shaft parallel M(in-lb)	±		+400	± 1000
0	± 1100	+400	± 1400	T/R shaft perp M(in-lb)	±		+200	± 1500
12.0 L	± 0.5	12.0 L	± 0.5	T/R blade pitch (deg)	±		13.5 L	± 0.5
+30000	± 10000	+19000	± 12000	T/B torque ² (in-lb)	±		+28000	± 12000
+275	±	+250	±	T/R shaft torque(ft-lb)	±		+310	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 46
Right Sideslip in Climb
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7500		7560		Gross weight(lb)	9260		8900	
4840		5290		Density altitude(ft)	4900		4610	
40		17.5		Air temperature(°C)	9.0		14.0	
319		323		Main rotor speed(rpm)	323		324	
69		71		Airspeed(KCAS)	71		71	
1000		1000		Rate of climb(fpm)	1000		1000	
23		22		Sideslip angle(deg)	24		23	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-175	± 225	-325	± 100	T/R red pitch link F(lb)	-150 ± 225		-350	± 100
-150	± 200		±	T/R white pitch link F(lb)	-100 ± 200		-300	± 100
+200	± 100	+75	± 50	T/R pitch cont tube axial F(lb)	+250 ± 100		0	± 50
0	± 10000	+15000	± 10000	T/B vertical M ² (in-lb)	+5000 ± 15000		+5000	± 10000
+110000	± 25000	+70000	± 40000	T/B lateral M ² (in-lb)	+95000 ± 20000		+80000	± 15000
+2200	± 400	+1200	± 200	Upper left fitting stress ² (psi)	+1700 ± 300		+1700	± 300
-15000	± 6000	-11000	± 5000	T/F forward & aft M ³ (in-lb)	-12000 ± 5000		-8500	± 6000
+26000	± 3000	+18000	± 2000	T/F lateral M ³ (in-lb)	+24000 ± 2000		+21000	± 1500
-100	± 700	+300	± 800	T/R shaft parallel M(in-lb)	-300 ± 800		+200	± 900
0	± 600	+300	± 900	T/R shaft perp M(in-lb)	+300 ± 1700		+200	± 1100
11.5 L	± 0.5	12.0 L	± 0.5	T/R blade pitch (deg)	12.0 L ± 0.5		14.0 L	± 0.5
+30000	± 8000	+10000	± 10000	T/B torque ² (in-lb)	+18000 ± 6000		+22000	± 8000
+400	±	+260	±	T/R shaft torque(ft-lb)	+365 ±		+330	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 47
Constant Power Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7720		7580		Gross weight(lb)	9340		8900	
3100		4140		Density altitude(ft)	4310		4490	
5.5		18.0		Air temperature(°C)	12.0		11.5	
328		328		Main rotor speed(rpm)	331		327	
96		98		Airspeed(KCAS)	92		92	
2.0		1.9		Normal acceleration(G's)	1.9		1.8	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-25	± 100	-75	± 25	T/R red pitch link F(lb)	-25	± 125	-100	± 25
+50	± 100	-50	± 25	T/R white pitch link F(lb)	+50	± 150	-100	± 50
-75	± 100	-275	± 100	T/R pitch cont tube axial F(lb)	-25	± 125	-100	± 50
-50000	± 20000	-45000	± 30000	T/B vertical M ² (in-lb)	-25000	± 25000	-35000	± 35000
+15000	± 20000	+45000	± 40000	T/B lateral M ² (in-lb)	+40000	± 30000	+60000	± 15000
+1100	± 500	+2000	± 400	Upper left fitting stress ² (psi)	+1500	± 400	+2500	± 600
-10000	± 8000	-15500	± 6500	T/F forward & aft M ³ (in-lb)	-13000	± 8000	-16000	± 10500
+5000	± 3000	+11000	± 3000	T/F lateral M ³ (in-lb)	+10000	± 4000	+14000	± 4000
+300	± 1000	+600	± 1100	T/R shaft parallel M(in-lb)	-100	± 1000	+400	± 1300
-100	± 800	+300	± 1100	T/R shaft perp M(in-lb)	+200	± 1100	+800	± 1300
1.0 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	4.0 L	± 0.5	5.0 L	± 0.5
+6000	± 8000	+6000	± 10000	T/B torque ² (in-lb)	+8000	± 8000	+22000	± 10000
+60	±	+60	±	T/R shaft torque(ft-lb)	+75	±	+80	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 48
Constant Power Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7630		7630		Gross weight (lb)	9270		8730	
3750		5530		Density altitude (ft)	4340		5000	
4.5		19.0		Air temperature (°C)	12.0		14.0	
323		327		Main rotor speed (rpm)	328		325	
129		126		Airspeed (KCAS)	120		118	
2.0		2.0		Normal acceleration (G's)	1.9		2.0	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-25	± 100	-75	± 50	T/R red pitch link F(lb)	-50	± 200	-50	± 50
+25	± 100	-50	± 75	T/R white pitch link F(lb)	+50	± 200	-25	± 50
-25	± 100	-100	± 75	T/R pitch cont tube axial F(lb)	+75	± 150	-75	± 75
-50000	±25000	-30000	±35000	T/B vertical M ² (in-lb)	-30000	±30000	-25000	±30000
+45000	±25000	+70000	±35000	T/B lateral M ² (in-lb)	+90000	±25000	+100000	±25000
+1700	± 400	+2800	± 500	Upper left fitting stress ² (psi)	+2700	± 500	+3100	± 600
-15000	±10000	-19500	±9500	T/F forward & aft M ³ (in-lb)	-20000	±10000	-12000	± 9000
+12000	± 3000	+14000	± 5000	T/F lateral M ³ (in-lb)	+20000	± 5000	+20000	± 4000
+400	±1200	+300	±1500	T/R shaft parallel M(in-lb)	0	±1400	+300	± 1500
0	±1100	+200	±1500	T/R shaft perp M(in-lb)	+100	±1500	+200	±1700
3.0 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	7.0 L	± 0.5	4.5 L	± 0.5
+12000	± 10000	+16000	±10000	T/B torque ² (in-lb)	+22000	±12000	+26000	±10000
+80	±	+60	±	T/R shaft torque(ft-lb)	+120	±	+60	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 49
Constant Power Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7660		7620		Gross weight (lb)	9300		8920	
3990		5120		Density altitude (ft)	3980		4410	
5.0		17.0		Air temperature (°C)	12.5		14.0	
329		328		Main rotor speed (rpm)	332		330	
95		102		Airspeed (KCAS)	86		93	
1.9		1.9		Normal acceleration (G's)	1.8		1.9	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±100	-50	±50	T/R red pitch link F(lb)	+50	±100	-50	±25
+75	±100	-25	±50	T/R white pitch link F(lb)	+150	±150	-25	±75
	±	-100	±50	T/R pitch cont tube axial F(lb)	-100	±125	-175	±50
-50000	±20000	-40000	±20000	T/B vertical M ² (in-lb)	-25000	±25000	-35000	±30000
+25000	±15000	+25000	±20000	T/B lateral M ² (in-lb)	+25000	±15000	+55000	±20000
+1300	±400	+1600	±500	Upper left fitting stress ² (psi)	+1200	±600	+2200	±700
-11000	±6000	-14500	±7000	T/F forward & aft M ³ (in-lb)	-11000	±8000	-12500	±10500
+4000	±3000	+8000	±4000	T/F lateral M ³ (in-lb)	+8000	±4000	+12000	±4000
+100	±1100	+400	±1200	T/R shaft parallel M (in-lb)	+200	±1100	+300	±1500
-100	±1000	+300	±1200	T/R shaft perp M (in-lb)	+300	±1100	+100	±1400
1.0 R ± 0.5		1.5 L ± 0.5		T/R blade pitch (deg)	1.5 L ± 0.5		2.5 L ± 0.5	
+8000	±8000	+8000	±8000	T/B torque ² (in-lb)	+6000	±8000	+18000	±8000
+55	±	+60	±	T/R shaft torque (ft-lb)	+65	±	+50	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 50
Constant Power Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7610		7650		Gross weight(lb)	9250		8810	
4150		4960		Density altitude(ft)	4350		4070	
4.5		19.0		Air temperature(°C)	12.0		14.0	
323		323		Main rotor speed(rpm)	325		328	
126		127		Airspeed (KCAS)	116		116	
1.9		2.2		Normal acceleration(G's)	1.7		1.9	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+75	±125	-0	±100	T/R red pitch link F(lb)	+25	±125	-25	±50
+125	±150	0	±100	T/R white pitch link F(lb)	+100	±150	0	±75
-150	±125	-150	±100	T/R pitch cont tube axial F(lb)	-100	±100	-200	±50
-50000	±30000	-45000	±45000	T/B vertical M ² (in-lb)	-20000	±50000	-20000	±25000
+45000	±25000	+90000	±45000	T/B lateral M ² (in-lb)	+95000	±25000	+100000	±25000
+1700	±400	+3000	±500	Upper left fitting stress ² (psi)	+2800	±500	+3200	±600
-14000	±10000	-17500	±10500	T/F forward & aft M ³ (in-lb)	-18500	±8500	-12000	±10000
+9000	±4000	+16000	±5000	T/F lateral M ³ (in-lb)	+19000	±3000	+17000	±5000
+200	±1200	+600	±1500	T/R shaft parallel M(in-lb)	0	±1200	+100	±1900
-100	±1000	+300	±1600	T/R shaft perp M(in-lb)	+200	±1300	0	±1500
0	±0.5	2.0 L	±0.5	T/R blade pitch (deg)	4.5 L	±0.5	3.0 L	±0.5
+14000	±8000	+18000	±12000	T/B torque ² (in-lb)	+20000	±8000	+28000	±12000
+60	±	+50	±	T/R shaft torque(ft-lb)	+74	±	+60	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 51
Constant Altitude Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOC CONFIGURATION			
801		212			801		212	
7290		7640		Gross weight(lb)	9010		9210	
4130		3940		Density altitude(ft)	3910		3840	
8.0		16.0		Air temperature(°C)	7.5		12.0	
324		324		Main rotor speed(rpm)	322		324	
99		98		Airspeed(KCAS)	88		92	
1.3		1.3		Normal acceleration(G's)	1.5		1.4	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±75	-50	±50	T/R red pitch link F(lb)	+25	±200	-75	±50
+75	±75	-25	±50	T/R white pitch link F(lb)	+50	±100	-75	±75
-100	±100	-50	±50	T/R pitch cont tube axial F(lb)	-50	±150	-100	±75
-15000	±15000	-10000	±15000	T/B vertical M ² (in-lb)	-25000	±25000	-20000	±10000
+65000	±10000	+70000	±10000	T/B lateral M ² (in-lb)	+110000	±20000	+80000	±15000
+1600	±400	+1800	±200	Upper left fitting stress ² (psi)	+2800	±400	+2700	±400
-25500	±5500	-26000	±6000	T/F forward & aft M ³ (in-lb)	-30000	±6000	-21000	±4500
+12000	±2000	+15000	±2000	T/F lateral M ³ (in-lb)	+24000	±3000	+18000	±2000
0	±800	+400	±1000	T/R shaft parallel M(in-lb)	-200	±1000	+400	±1000
+200	±900	+300	±1100	T/R shaft perp M(in-lb)	+100	±900	+700	±1100
20 L	±0.5	3.5 L	±0.5	T/R blade pitch (deg)	5.5 L	±0.5	4.5 L	±0.5
+6000	±6000	+12000	±6000	T/B torque ² (in-lb)	+26000	±10000	+22000	±6000
+60	±	+55	±	T/R shaft torque(ft-lb)	+85	±	+65	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 52
Constant Altitude Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7470		7680		Gross weight(lb)	8970		8970	
3950		4140		Density altitude(ft)	4210		3730	
1.0		17.5		Air temperature(°C)	10.0		14.0	
327		323		Main rotor speed(rpm)	322		321	
127		127		Airspeed(KCAS)	119		121	
1.5		1.4		Normal acceleration(G's)	1.3		1.3	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	±125	-100	±75	T/R red pitch link F(lb)	+50	±200	-75	±75
+25	±150	-75	±100	T/R white pitch link F(lb)	+25	±200	-75	±75
0	±150	-100	±75	T/R pitch cont tube axial F(lb)	-50	±150	-175	±75
-35000	±15000	-15000	±25000	T/B vertical M ² (in-lb)	-15000	±20000	-20000	±25000
+105000	±25000	+115000	±30000	T/B lateral M ² (in-lb)	+130000	±35000	+135000	±20000
+2900	±400	+3400	±600	Upper left fitting stress ² (psi)	+3400	±400	+3900	±500
-26000	±8000	-26000	±7000	T/F forward & aft M ³ (in-lb)	-29000	±7000	-20000	±7000
+24000	±4000	+28000	±5000	T/F lateral M ³ (in-lb)	+26000	±4000	+27000	±5000
0	±1200	+400	±1500	T/R shaft parallel M(in-lb)	-100	±2100	+600	±1200
0	±900	+200	±1500	T/R shaft perp M(in-lb)	+400	±1900	+200	±1500
4.5 L	±0.5	5.5 L	±0.5	T/R blade pitch (deg)	7.5 L	±0.5	5.5 L	±0.5
+24000	±9000	+26000	±12000	T/B torque ² (in-lb)	+26000	±6000	+36000	±10000
+85	±	+140	±	T/R shaft torque(ft-lb)	+75	±	+55	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 53
Constant Altitude Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801	212				801	212		
7270	7600			Gross weight (lb)	8950	9230		
4020	3910			Density altitude (ft)	4240	3810		
8.0	16.0			Air temperature (°C)	6.5	12.0		
324	323			Main rotor speed (rpm)	321	324		
104	97			Airspeed (KCAS)	90	93		
1.2	1.4			Normal acceleration (G's)	1.4	1.3		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+75	±100	-25	±50	T/R red pitch link F(lb)	+25	±200	-25	±25
+100	±75	0	±50	T/R white pitch link F(lb)	+75	±100	-25	±50
-125	±75	-75	±50	T/R pitch cont tube axial F(lb)	-100	±200	-150	±50
-20000	±15000	-15000	±20000	T/B vertical M ² (in-lb)	-25000	±20000	-10000	±10000
+100000	±15000	+75000	±12000	T/B lateral M ² (in-lb)	+120000	±25000	+85000	±10000
+1600	±400	+2200	±300	Upper left fitting stress ² (psi)	+3200	±400	+2700	±200
-25000	±6500	-22000	±5000	T/F forward & aft M ³ (in-lb)	-31000	±5000	-24000	±5000
+9000	±2000	+16000	±2000	T/F lateral M ³ (in-lb)	+24000	±3000	+18000	±2000
0	±1000	+400	±1200	T/R shaft parallel M (in-lb)	-100	±1000	+300	±1000
+300	±900	+300	±1100	T/R shaft perp M (in-lb)	0	±1000	+800	±1000
2.5 L	±0.5	3.0 L	±0.5	T/R blade pitch (deg)	4.0 L	±0.5	2.5 L	±0.5
+4000	±8000	+22000	±6000	T/B torque ² (in-lb)	+26000	±10000	+26000	±6000
+45	±	+55	±	T/R shaft torque (ft-lb)	+65	±	+60	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 54
Constant Altitude Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7770		7700		Gross weight (lb)	8930		8990	
3830		3830		Density altitude (ft)	3800		3380	
5.5		16.0		Air temperature (°C)	11.0		13.5	
320		325		Main rotor speed (rpm)	322		319	
128		126		Airspeed (KCAS)	119		119	
1.3		1.4		Normal acceleration (G's)	1.4		1.4	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 75	±150	-25	±50	T/R red pitch link F(lb)	-25	±150	-25	±50
+125	±100	-25	±50	T/R white pitch link F(lb)	+25	±150	-25	±100
- 75	±100	-125	±50	T/R pitch cont tube axial F(lb)	-75	±175	-200	±50
-20000	±25000	-15000	±20000	T/B vertical M ² (in-lb)	-15000	±30000	-15000	±30000
+110000	±20000	+115000	±20000	T/B lateral M ² (in-lb)	+135000	±45000	+145000	±20000
+2700	±400	+3400	±300	Upper left fitting stress ² (psi)	+3600	±500	+4000	±500
-22500	±7500	-21000	±9000	T/F forward & aft M ³ (in-lb)	-24000	±9500	-15500	±10500
+20000	±4000	+23000	±4000	T/F lateral M ³ (in-lb)	+25000	±4000	+25000	±5000
+200	±1000	+600	±1300	T/R shaft parallel M (in-lb)	-200	±1300	+500	±1500
-100	±800	0	±1500	T/R shaft perp M (in-lb)	+400	±2200	+400	±1300
1.5 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	30 L	± 0.5	4.0 L	± 0.5
+26000	±8000	+16000	±10000	T/B torque ² (in-lb)	+28000	±6000	+38000	±12000
+60	±	+60	±	T/R shaft torque (ft-lb)	+70	±	+30	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 55
Left Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7590		7230		Gross weight(lb)	8530		9090	
4140		4160		Density altitude(ft)	4170		3660	
8.0		17.0		Air temperature(°C)	7.0		14.0	
324		324		Main rotor speed(rpm)	324		322	
126		129		Airspeed(KCAS)	108		119	
0.5		0.7		Dir cont displ(in)	0.6		0.8	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-75	±150	-150	±50	T/R red pitch link F(lb)	-25 ±100		-275 ±100	
0	±175		±	T/R white pitch link F(lb)	0 ±100		-225 ±75	
+100	±150	+75	±100	T/R pitch cont tube axial F(lb)	+25 ±175		+25 ±75	
-5000	±40000	-10000	±20000	T/R vertical M ² (in-lb)	-15000 ±20000		-20000 ±15000	
+35000	±10000	+50000	±20000	T/B lateral M ² (in-lb)	+70000 ±20000		+35000 ±20000	
+2000	±600	+2700	±1000	Upper left fitting stress ² (psi)	+1800 ±400		+1300 ±300	
-25000	±7000	-12000	±6000	T/F forward & aft M ³ (in-lb)	-27000 ±7000		-14500 ±6500	
+17000	±3000	+17000	±6000	T/F lateral M ³ (in-lb)	+17000 ±3000		+14000 ±5000	
0	±1000	0	±1100	T/R shaft parallel M(in-lb)	0 ±900		+300 ±1100	
+300	±1000	+300	±1300	T/R shaft perp M(in-lb)	0 ±1000		-100 ±1400	
3.5 L	± 0.5	7.0 L	± 0.5	T/R blade pitch (deg)	0.5 L ± 0.5		10.0 L ± 0.5	
+26000	±8000	+28000	±12000	T/B torque ² (in-lb)	+16000 ±8000		+18000 ±14000	
+30	±	+60	±	T/R shaft torque(ft-lb)	+85 ±		+120 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 56
Left Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212	
7540		7560		Gross weight(lb)	7800		9140	
3940		3780		Density altitude(ft)	4290		4280	
11.5		17.0		Air temperature(°C)	10.0		17.0	
322		324		Main rotor speed(rpm)	322		324	
125		123		Airspeed(KCAS)	118		119	
1.1		1.0		Dir cont displ(in)	1.1		1.0	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-100 ± 200		-175 ± 150		T/R red pitch link F(lb)	-25 ± 150		-300 ± 125	
-200 ± 250		-175 ± 125		T/R white pitch link F(lb)	-50 ± 150		-275 ± 125	
+150 ± 150		+50 ± 100		T/R pitch cont tube axial F(lb)	+25 ± 175		+100 ± 100	
-30000 ± 15000		-5000 ± 25000		T/B vertical M ² (in-lb)	-10000 ± 20000		-15000 ± 20000	
+20000 ± 20000		+45000 ± 40000		T/B lateral M ² (in-lb)	+50000 ± 20000		+40000 ± 30000	
+1000 ± 200		+2500 ± 1000		Upper left fitting stress ² (psi)	+3000 ± 400		+1100 ± 400	
-20000 ± 6000		-16000 ± 8000		T/F forward & aft M ³ (in-lb)	-16500 ± 6500		-18000 ± 6000	
+12000 ± 2000		+13000 ± 5000		T/F lateral M ³ (in-lb)	+15000 ± 3000		+13000 ± 5000	
+100 ± 800		+200 ± 1100		T/R shaft parallel M(in-lb)	-100 ± 1100		+300 ± 900	
+400 ± 1000		+300 ± 1600		T/R shaft perp M(in-lb)	+300 ± 2400		+400 ± 1500	
9.0 L ± 0.5		9.0 L ± 0.5		T/R blade pitch (deg)	12.5 L ± 0.5		11.0 L ± 0.5	
+14000 ± 6000		+16000 ± 12000		T/B torque ² (in-lb)	+12000 ± 8000		+10000 ± 6000	
+155 ±		+95 ±		T/R shaft torque(ft-lb)	+185 ±		+150 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 57
Right Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7580		7240		Gross weight(lb)	8900		9100	
4120		4130		Density altitude(ft)	4000		3760	
7.5		17.5		Air temperature(°C)	7.0		14.0	
324		323		Main rotor speed(rpm)	324		323	
126		127		Airspeed(KCAS)	117		119	
0.3		0.4		Dir cont displ(in)	0.5		0.5	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+100	±125	+25	±50	T/R red pitch link F(lb)	+150 ±200		+75 ±50	
+125	±150		±	T/R white pitch link F(lb)	+125 ±150		+75 ±50	
-190	±100	-175	±75	T/R pitch cont tube axial F(lb)		±	+50 ±75	
-15000	±20000	0	±20000	T/B vertical M ² (in-lb)	-10000 ±15000		+10000 ±15000	
+60000	±10000	+105000	±20000	T/B lateral M ² (in-lb)	+90000 ±25000		+125000 ±20000	
+1700	±400	+2700	±400	Upper left fitting stress ² (psi)	+1900 ±300		+3000 ±300	
-22000	±7000	-19000	±6000	T/F forward & aft M ³ (in-lb)	-25000 ±7000		-16500 ±5000	
+14000	±2000	+13000	±5000	T/F lateral M ³ (in-lb)	+14000 ±3000		+17000 ±5000	
0	±1000	+500	±1100	T/R shaft parallel M(in-lb)	0 ±1000		+400 ±1200	
+200	±900	0	±1100	T/R shaft pr p M(in-lb)	0 ±900		+200 ±1100	
1.5 R ± 0.5		0	± 0.5	T/R blade pitch (deg)	1.0 R ± 0.5		0.5 L ± 0.5	
-9000	±9000	+14000	±8000	T/B torque ² (in-lb)	+16000 ±6000		+28000 ±8000	
+5	±	+55	±	T/R shaft torque(ft-lb)	+45 ±		+30 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 58
Right Directional Control Step
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7540		7220		Gross weight(lb)	8790		9110	
3980		4290		Density altitude(ft)	4250		4410	
12.0		17.0		Air temperature(°C)	10.0		16.5	
323		323		Main rotor speed(rpm)	324		324	
124		126		Airspeed(KCAS)	119		117	
1.1		0.8		Dir cont displ(in)	1.2		1.2	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+200	±175	0	±15	T/R red pitch link F(lb)	+225 ±225		+150 ±100	
+200	±250		±	T/R white pitch link F(lb)	+250 ±250		+150 ±100	
-250	±225	-225	±15	T/R pitch cont tube axial F(lb)	-300 ±275		-275 ±150	
+15000	±15000	+10000	±15000	T/B vertical M ² (in-lb)	+25000 ±15000		+20000 ±15000	
+95000	±15000	+65000	±50000	T/B lateral M ² (in-lb)	+130000 ±20000		+140000 ±20000	
+3000	±400	+2000	±700	Upper left fitting stress ² (psi)	+3000 ±400		+3000 ±300	
-19000	±5000	-17000	±7000	T/F forward & aft M ³ (in-lb)	-19000 ±6000		-20000 ±5500	
+12000	±3000	+17000	±5000	T/F lateral M ³ (in-lb)	+16000 ±5000		+17000 ±5000	
0	±1000	+200	±1300	T/R shaft parallel M(in-lb)	0 ±1300		+300 ±1400	
+500	±900	+300	±1100	T/R shaft perp M(in-lb)	+400 ±2100		+600 ±1400	
5.0 R ± 0.5		1.0 R ± 0.5		T/R blade pitch (deg)	1.0 R ± 0.5		2.5 R ± 0.5	
+12000	±4000	+12000	±10000	T/B torque ² (in-lb)	+24000 ±8000		+24000 ±6000	
+30	±	+55	±	T/R shaft torque(ft-lb)	+20 ±		+35 ±	

¹Average longitudinal CG at fuselage station 155.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 59
Left Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7400		7520		Gross weight(lb)	8770		8830	
3960		3860		Density altitude(ft)	4150		4050	
4.0		17.0		Air temperature(°C)	10.5		18.0	
324		324		Main rotor speed(rpm)	323		324	
126		126		Airspeed(KCAS)	118		118	
± 0.8		± 1.0		Dir cont displ(in)	± 1.0		± 0.9	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+150 ± 200		-75 ± 100		T/R red pitch link F(lb)	+100 ± 175		-150 ± 125	
+150 ± 225		-100 ± 110		T/R white pitch link F(lb)	+50 ± 150		-225 ± 100	
-400 ± 250		-150 ± 100		T/R pitch cont tube axial F(lb)	+100 ± 200		-250 ± 100	
0 ± 20000		+15000 ± 20000		T/B vertical M ² (in-lb)	0 ± 15000		+15000 ± 15000	
+145000 ± 15000		+160000 ± 25000		T/B lateral M ² (in-lb)	+25000 ± 20000		+100000 ± 15000	
3100 ± 400		+4000 ± 500		Upper left fitting stress ² (psi)	+2500 ± 300		+3300 ± 200	
-20000 ± 5000		-26500 ± 6000		T/F forward & aft M ³ (in-lb)	-20000 ± 5000		-24000 ± 6500	
+20000 ± 2000		+31000 ± 3000		T/F lateral M ³ (in-lb)	+27000 ± 2000		+30000 ± 2000	
0 ± 900		-300 ± 1500		T/R shaft parallel M(in-lb)	-200 ± 1000		+200 ± 1000	
0 ± 700		+300 ± 1400		T/R shaft perp M(in-lb)	-100 ± 900		+200 ± 900	
2.5 L ± 0.5		4.0 L ± 0.5		T/R blade pitch (deg)	6.5 L ± 0.5		7.0 L ± 0.5	
+20000 ± 6000		+32000 ± 10000		T/B torque ² (in-lb)	+26000 ± 8000		+28000 ± 8000	
+60 ±		+75 ±		T/R shaft torque(ft-lb)	+100 ±		+150 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 60
Right Directional Control Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION						HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹		801		212		
7400		7520		Gross weight(lb)		8770		8850		
3960		4000		Density altitude(ft)		4150		4280		
4.0		18.0		Air temperature(°C)		10.5		17.0		
323		324		Main rotor speed(rpm)		323		324		
126		126		Airspeed(KCAS)		118		118		
± 0.7		± 0.7		Dir cont displ(in)		± 1.0		± 1.0		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC	
+100 ± 150		-100 ± 75		T/R red pitch link F(lb)		+75 ± 75		-75 ± 75		
+100 ± 125		-75 ± 100		T/R white pitch link F(lb)		+150 ± 75		-50 ± 75		
-200 ± 125		-25 ± 100		T/R pitch cont tube axial F(lb)		-100 ± 100		+100 ± 50		
-5000 ± 20000		-25000 ± 20000		T/B vertical M ² (in-lb)		-10000 ± 15000		-35000 ± 15000		
+40000 ± 25000		+5000 ± 25000		T/B lateral M ² (in-lb)		+35000 ± 15000		0 ± 15000		
+1400 ± 400		+800 ± 500		Upper left fitting stress ² (psi)		+1200 ± 300		+300 ± 300		
-15000 ± 5000		-16000 ± 6000		T/F forward & aft M ³ (in-lb)		-14500 ± 5500		-12000 ± 5000		
+2000 ± 4000		+3000 ± 4000		T/F lateral M ³ (in-lb)		+10000 ± 4000		+5000 ± 3000		
+200 ± 1000		+300 ± 1200		T/R shaft parallel M(in-lb)		-100 ± 900		+200 ± 1200		
+200 ± 1000		+400 ± 1300		T/R shaft perp M(in-lb)		-100 ± 900		+300 ± 1100		
4.5 R ± 0.5		1.5 L ± 0.5		T/R blade pitch (deg)		0.5 R ± 0.5		2.5 R ± 0.5		
0 ± 8000		10000 ± 10000		T/B torque ² (in-lb)		+6000 ± 8000		+6000 ± 6000		
+15 ±		+20 ±		T/R shaft torque(ft-lb)		+20 ±		+30 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 61
Left Roll Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
212	212				212	212		
7 530	7690			Gross weight(lb)	9050	9150		
3870	3560			Density altitude(ft)	4080	3840		
3.0	14.5			Air temperature(°C)	11.5	12.5		
324	324			Main rotor speed(rpm)	325	324		
129	127			Airspeed(KCAS)	120	120		
± 15	± 30			Bank angle(deg)	± 15	± 30		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-75	± 50	-50	± 100	T/R red pitch link F(lb)	-25	± 50	-50	± 50
-100	± 50	-25	± 100	T/R white pitch link F(lb)	-25	± 50	-50	± 75
-200	± 75	-50	± 100	T/R pitch cont tube axial F(lb)	-125	± 75	-150	± 75
-15,000	± 20,000	-5000	± 25,000	T/B vertical M ² (in-lb)	-10,000	± 20,000	-10,000	± 25,000
+65,000	± 20,000	+80,000	± 20,000	T/B lateral M ² (in-lb)	+110,000	± 20,000	+110,000	± 20,000
+2600	± 400	+2000	± 500	Upper left fitting stress ² (psi)	+1300	± 500	+3200	± 400
-18,000	± 5000	-14,000	± 6000	T/F forward & aft M ³ (in-lb)	-17,500	± 6500	-20,000	± 7500
+22000	± 3000	+12,000	± 2000	T/F lateral M ³ (in-lb)	+19,000	± 3,000	+18,000	± 4000
+500	± 500	+400	± 1300	T/R shaft parallel M(in-lb)	+300	± 1100	+300	± 1100
+100	± 500	+300	± 1200	T/R shaft perp M(in-lb)	+300	± 1200	+500	± 1100
4. L	± 0.5	4. L	± 0.5	T/R blade pitch (deg)	3 L	± 1.	3 L	± 0.5
+16,000	± 6000	+8000	± 6000	T/B torque ² (in-lb)	+18,000	± 8000	+16,000	± 8000
+65	±	+65	±	T/R shaft torque(ft-lb)	+70	±	+60	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 62
Left Roll Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7390		7190		Gross weight(lb)	9370		9080	
3600		3650		Density altitude(ft)	4000		4160	
4.0		16.5		Air temperature(°C)	12.0		17.0	
323		325		Main rotor speed(rpm)	320		324	
138		126		Airspeed(KCAS)	112		121	
± 45		± 45		Bank angle(deg)	± 45		± 45	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 100	-25	± 100	T/R red pitch link F(lb)	+ 50	± 75	-75	± 75
+ 75	± 100		±	T/R white pitch link F(lb)	+ 25	± 50	-75	± 75
- 50	± 125	0	± 125	T/R pitch cont tube axial F(lb)	-200	± 125	-125	± 75
-15,000	± 25,000	-20,000	± 35,000	T/B vertical M ² (in-lb)	-10,000	± 20,000	-20,000	± 25,000
+ 90,000	± 20,000	+100,000	± 25,000	T/B lateral M ² (in-lb)	+100,000	± 25,000	+105,000	± 25,000
+ 2600	± 400	+ 2400	± 900	Upper left fitting stress ² (psi)	+ 3400	± 400	+ 2600	± 700
-21,000	± 9000	-21,000	± 7500	T/F forward & aft M ³ (in-lb)	-28,500	± 7500	-22,000	± 9500
+18,000	± 4000	+15,000	± 3000	T/F lateral M ³ (in-lb)	+ 24000	± 3000	+ 21,000	± 4000
0	± 1100	+ 300	± 1400	T/R shaft parallel M(in-lb)	0	± 1100	+ 100	± 1500
-100	± 1000	+ 200	± 800	T/R shaft perp M(in-lb)	0	± 600	+ 300	± 800
1. L	± 0.5	1. L	± 1.	T/R blade pitch (deg)	3. L	± 0.5	4. L	± 0.5
+ 20,000	± 10,000	+14,000	± 10,000	T/B torque ² (in-lb)	+18,000	± 2000	+16,000	± 8000
+ 85	±	+ 40	±	T/R shaft torque(ft-lb)	+ 110	±	+ 70	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 63
Right Roll Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
212		212			212		212	
7500		7670		Gross weight (lb)	9030		9130	
4070		3110		Density altitude (ft)	4130		3650	
3.5		13.0		Air temperature (°C)	11.5		12.0	
322		324		Main rotor speed (rpm)	323		323	
126		128		Airspeed (KCAS)	119		120	
±15		±30		Bank angle (deg)	±15		±30	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-25	±50	-100	±100	T/R red pitch link F(lb)	-50 ±75		-75 ±50	
0	±50	-75	±100	T/R white pitch link F(lb)	-25 ±75		-75 ±50	
-100	±50	-25	±50	T/R pitch cont tube axial F(lb)	-125 ±75		-150 ±50	
-20000	±15000	-10000	±25000	T/B vertical M ² (in-lb)	+20000 ±20000		-5000 ±25000	
+30000	±20000	+90000	±25000	T/B lateral M ² (in-lb)	+130000 ±20000		+130000 ±20000	
+2200	±300	+2400	±600	Upper left fitting stress ² (psi)	+2800 ±400		+3800 ±200	
-19000	±4500	-23000	±7000	T/F forward & aft M ³ (in-lb)	-20500 ±5500		-22000 ±8000	
+22000	±3000	+19000	±4000	T/F lateral M ³ (in-lb)	+23000 ±4000		+22000 ±3000	
+400	±600	+500	±1200	T/R shaft parallel M (in-lb)	+200 ±1200		+400 ±1000	
+100	±900	+300	±1500	T/R shaft perp M (in-lb)	+300 ±1400		+600 ±1500	
5.0 L ± 0.5		6.0 L ± 0.5		T/R blade pitch (deg)	4.5 L ± 0.5		5.0 L ± 0.5	
+26000	±6000	+16000	±6000	T/B torque ² (in-lb)	+20000 ±10000		+30000 ±10000	
+65 ±		+105 ±		T/R shaft torque (ft-lb)	+85 ±		+90 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 64
Right Roll Reversal
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7380		7180		Gross weight(lb)	9350		9060	
3270		3610		Density altitude(ft)	3850		4070	
4.5		16.0		Air temperature(°C)	13.0		17.5	
324		324		Main rotor speed(rpm)	319		324	
126		126		Airspeed(KCAS)	115		121	
±45		±45		Bank angle(deg)	±45		±45	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+75	±100	-75	±75	T/R red pitch link F(lb)	0	±100	-125	±175
+75	±100		±	T/R white pitch link F(lb)	-25	±100	-75	±125
-50	±75	-125	±100	T/R pitch cont tube axial F(lb)	0	±75	-100	±75
-25000	±25000	-10000	±30000	T/B vertical M ² (in-lb)	-20000	±50000	-5000	±40000
+80000	±30000	+100000	±40000	T/B lateral M ² (in-lb)	+125000	±30000	+130000	±40000
+2200	±400	+1600	±700	Upper left fitting stress ² (psi)	+3300	±500	+3100	±800
-20000	±8000	-23000	±9000	T/F forward & aft M ³ (in-lb)	-30000	±10000	-26500	±11000
+15000	±4000	+17000	±5000	T/F lateral M ³ (in-lb)	+25000	±4000	+27000	±6000
+100	±1100	+100	±1300	T/R shaft parallel M(in-lb)	+100	±1300	+200	±1500
0	±700	+200	±1500	T/R shaft perp M(in-lb)	+100	±1300	+300	±1700
0.5 L	±0.5	3.5 L	±0.5	T/R blade pitch (deg)	2.5 L	±0.5	4.5 L	±0.5
+18000	±8000	+16000	±9000	T/B torque ² (in-lb)	+22000	±8000	+26000	±9000
+80	±	+90	±	T/R shaft torque(ft-lb)	+150	±	+150	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 65
Gunnery Dive
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
1290		7760		Gross weight(lb)	9050		9180	
2500		5550		Density altitude(ft)	4200		4770	
4.5		18.5		Air temperature(°C)	12.5		17.0	
322		323		Main rotor speed(rpm)	327		322	
168		156		Airspeed(KCAS)	164		169	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	± 150	-50	± 75	T/R red pitch link F(lb)	0	± 150	-50	± 75
+50	± 150	0	± 75	T/R white pitch link F(lb)	+25	± 75	-50	± 75
-200	± 150	-100	± 100	T/R pitch cont tube axial F(lb)	-50	± 150	-100	± 50
-25000	± 40000	-10000	± 35000	T/B vertical M ² (in-lb)	-20000	± 30000	-5000	± 30000
+40000	± 35000	+80000	± 45000	T/B lateral M ² (in-lb)	+80000	± 35000	+120000	± 45000
+2800	± 400	+2200	± 600	Upper left fitting stress ² (psi)	+3000	± 600	+1700	± 800
-20000	± 12000	-16500	± 9000	T/F forward & aft M ³ (in-lb)	-18000	± 11500	-22000	± 8000
+14000	± 6000	+16000	± 7000	T/F lateral M ³ (in-lb)	+18000	± 5000	+19000	± 6000
+300	± 1400	+100	± 1300	T/R shaft parallel M(in-lb)	0	± 1500	+200	± 1300
+100	± 1200	+100	± 1500	T/R shaft perp M(in-lb)	-100	± 1200	-100	± 1400
3.0 L	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	2.0 L	± 0.5	4.0 L	± 0.5
10000	± 6000	+14000	± 14000	T/B torque ² (in-lb)	+18000	± 8000	+16000	± 12000
+85	±	+60	±	T/R shaft torque(ft-lb)	+110	±	+70	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 66
Gunnery Dive Pushover Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7360		7490		Gross weight (lb)	8690		9000	
4490		4440		Density altitude (ft)	4640		4520	
4.0		2.5		Air temperature (°C)	9.0		11.0	
320		323		Main rotor speed (rpm)	323		324	
104		97		Airspeed (KAS)	97		97	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 75	0	± 50	T/R red pitch link F(lb)	+ 50	± 125	- 25	± 50
+ 75	± 75	0	± 50	T/R white pitch link F(lb)	+125	± 125	- 25	± 75
- 50	± 125	- 100	± 50	T/R pitch cont tube axial F(lb)	- 150	± 125	- 75	± 75
- 10,000	± 15,000	+ 5000	± 10,000	T/B vertical M ² (in-lb)	0	± 15,000	- 10,000	± 20,000
+ 70,000	± 20,000	+ 70,000	± 15,000	T/B lateral M ² (in-lb)	+ 70,000	± 15,000	+ 60,000	± 25,000
+ 1100	± 300	+ 1100	± 300	Upper left fitting stress ² (psi)	+ 1600	± 300	+ 1500	± 700
- 24,000	± 8,000	- 23,500	± 7000	T/F forward & aft M ³ (in-lb)	- 20,500	± 5500	- 19,000	± 10,500
+ 16,000	± 4,000	+ 17,000	± 2000	T/F lateral M ³ (in-lb)	+ 17,000	± 3000	+ 11,000	± 6000
+ 100	± 900	+ 400	± 600	T/R shaft parallel M (in-lb)	0	± 800	+ 100	± 1600
- 100	± 800	+ 100	± 500	T/R shaft perp M (in-lb)	0	± 1600	+ 400	± 1600
1. L	± 0.5	3.5 L	± 0.5	T/R blade pitch (deg)	4.5 L	± 1.	2.5 L	± 1.
0	± 8000	+ 8000	± 6000	T/B torque ² (in-lb)	+ 14,000	± 8000	+ 10,000	± 8000
+ 60	±	+ 55	±	T/R shaft torque (ft-lb)	+ 55	±	+ 60	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 67
Gunnery Dive Pushover Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7290		7140		Gross weight (lb)	9050		9240	
3810		5650		Density altitude(ft)	5490		4920	
3.5		14.5		Air temperature(°C)	11.5		13.5	
320		324		Main rotor speed(rpm)	323		323	
126		127		Airspeed(KCAS)	126		120	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 125	- 75	± 100	T/R red pitch link F(lb)	+ 25 ± 125	- 25 ± 50		
+ 75	± 100	0	± 100	T/R white pitch link F(lb)	+ 25 ± 100	- 25 ± 75		
- 100	± 150	- 75	± 125	T/R pitch cont tube axial F(lb)	- 100 ± 125	- 150 ± 75		
- 5000	± 20,000	+ 5000	± 20,000	T/B vertical M ² (in-lb)	- 10,000 ± 10,000	0 ± 15,000		
+ 75,000	± 20,000	+ 75,000	± 20,000	T/B lateral M ² (in-lb)	+ 90,000 ± 15,000	+ 100,000 ± 25,000		
+ 1800	± 400	+ 1500	± 400	Upper left fitting stress ² (psi)	+ 2800 ± 200	+ 2500 ± 500		
- 16,000	± 8000	- 15,500	± 7500	T/F forward & aft M ³ (in-lb)	- 17,000 ± 5000	- 14,000 ± 6000		
+ 16,000	± 4000	+ 14,000	± 5000	T/F lateral M ³ (in-lb)	+ 21,000 ± 3000	+ 20000 ± 6000		
+ 200	± 1100	+ 500	± 1300	T/R shaft parallel M(in-lb)	0 ± 1000	+ 400 ± 1300		
- 100	± 800	+ 300	± 1500	T/R shaft perp M(in-lb)	+ 100 ± 900	+ 300 ± 1400		
0.5 L	± 0.5	3. L	± 0.5	T/R blade pitch (deg)	2.5 L ± 0.5	3.5 L ± 1.		
+ 18,000	± 8000	+ 10,000	± 8000	T/B torque ² (in-lb)	+ 14,000 ± 6000	+ 20,000 ± 10,000		
+ 65	±	+ 65	±	T/R shaft torque(ft-lb)	+ 70 ±	+ 60 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 68
Gunnery Dive Rolling Left Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7340		7190		Gross weight(lb)	9140		9270	
4010		5350		Density altitude(ft)	4980		4960	
4.0		15.5		Air temperature(°C)	13.0		13.5	
320		321		Main rotor speed(rpm)	322		322	
99		103		Airspeed(KCAS)	97		93	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 125	- 50	± 50	T/R red pitch link F(lb)	0	± 150	- 50	± 50
+ 50	± 100	- 25	± 75	T/R white pitch link F(lb)	+ 25	± 100	- 50	± 75
- 50	± 125	- 50	± 75	T/R pitch cont tube axial F(lb)	+ 25	± 150	- 225	± 75
-10,000	±10,000	- 5000	±3,000	T/B vertical M ² (in-lb)	-10,000	±10,000	0	±15,000
+60,000	±20,000	+45,000	±25,000	T/B lateral M ² (in-lb)	+60,000	±15,000	+90,000	±15,000
+1300	± 300	+1100	± 400	Upper left fitting stress ² (psi)	+2000	± 200	+2300	± 300
-19,000	±5000	-24,500	±7500	T/F forward & aft M ³ (in-lb)	-23,000	±3500	-17,500	±5500
+14,000	±2000	+7000	±3000	T/F lateral M ³ (in-lb)	+18,000	±2000	+15,000	±3000
+ 100	± 800	+ 500	±1000	T/R shaft parallel M(in-lb)	0	± 600	+ 200	± 1000
- 100	± 800	+ 400	± 900	T/R shaft perp M(in-lb)	+100	± 900	+ 200	± 900
1.5 L	± 0.5	2.5 L	± 0.5	T/R blade pitch (deg)	3.5 L	± 0.5	3. L	± 1.
+16,000	±8000	+6000	±6000	T/B torque ² (in-lb)	+12,000	±4000	+20,000	±6000
+ 65	±	+ 60	±	T/R shaft torque(ft-lb)	+ 90	±	+ 65	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 69
Gunnery Dive Rolling Left Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7260		7690		Gross weight(lb)	9000		8980	
4050		5190		Density altitude(ft)	5570		4780	
3.5		19.0		Air temperature(°C)	11.5		16.0	
320		324		Main rotor speed(rpm)	323		321	
125		126		Airspeed(KCAS)	120		126	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 25	± 100	- 25	± 100	T/R red pitch link F(lb)	+ 25	± 125	- 150	± 100
+ 50	± 100	+ 25	± 100	T/R white pitch link F(lb)	+ 25	± 100	- 100	± 125
- 50	± 100	- 75	± 100	T/R pitch cont tube axial F(lb)	- 75	± 150	- 25	± 75
-15,000	±15,000	- 5000	±25,000	T/B vertical M ² (in-lb)	-15,000	±20,000	-15,000	±20,000
+75,000	±25,000	+90,000	±25,000	T/B lateral M ² (in-lb)	+80,000	±15,000	+115,000	±20,000
+1900	± 400	+2600	± 500	Upper left fitting stress ² (psi)	+2800	± 200	+ 3000	± 300
-17,000	± 7000	-23,500	±8000	T/F forward & aft M ³ (in-lb)	-17,000	± 6000	-18,000	± 8000
+16,000	± 2000	+14,000	± 4000	T/F lateral M ³ (in-lb)	+21,000	± 2000	+24,000	± 4000
+ 100	± 700	+ 600	±1000	T/R shaft parallel M(in-lb)	0	± 900	+ 200	± 900
0	± 900	+ 500	±1000	T/R shaft perp M(in-lb)	0	± 900	+ 500	±1000
2. L	± 0.5	3.0 L	± 1.5	T/R blade pitch (deg)	2. L	± 0.5	4.5 L	± 0.5
+18,000	±10,000	+8000	±10000	T/B torque ² (in-lb)	+14,000	± 6000	+22,000	±10,000
+ 70	±	+ 90	±	T/R shaft torque(ft-lb)	+ 70	±	+ 100	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 70
Gunnery Dive Rolling Right Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7340		7240		Gross weight(lb)	9200		9310	
3950		5270		Density altitude(ft)	4970		5090	
4.0		16.0		Air temperature(°C)	13.5		13.5	
322		322		Main rotor speed(rpm)	323		324	
102		101		Airspeed(KCAS)	97		97	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+100	± 100	-75	± 50	T/R red pitch link F(lb)	+50 ± 100	-25 ± 100		
+100	± 100	-25	± 75	T/R white pitch link F(lb)	+75 ± 75	0 ± 100		
-125	± 125	-75	± 75	T/R pitch cont tube axial F(lb)	-125 ± 150	-150 ± 100		
-10,000	± 20,000	-10,000	± 30,000	T/B vertical M ² (in-lb)	-20,000 ± 10,000	-15,000 ± 20,000		
+50,000	± 15,000	+45,000	± 30,000	T/B lateral M ² (in-lb)	+55,000 ± 15,000	+40,000 ± 20,000		
+1000	± 400	+1100	± 300	Upper left fitting stress ² (psi)	+2000 ± 200	+2000 ± 300		
-22,000	± 7000	-23,000	± 7500	T/F forward & aft M ³ (in-lb)	-20,000 ± 4000	-20,500 ± 6500		
+11,000	± 3000	+6000	± 3000	T/F lateral M ³ (in-lb)	+16,000 ± 2000	+14,000 ± 2000		
+100	± 800	+400	± 1300	T/R shaft parallel M(in-lb)	0 ± 700	+500 ± 900		
-200	± 700	+300	± 1100	T/R shaft perp M(in-lb)	+100 ± 600	+100 ± 1000		
1. R	± 0.5	1. L	± 0.5	T/R blade pitch (deg)	1.5 L ± 0.5	3.5 L ± 1.		
+14,000	± 8000	+8000	± 6000	T/B torque ² (in-lb)	+8000 ± 4000	+12,000 ± 8000		
+50	±	+50	±	T/R shaft torque(ft-lb)	+55 ±	+45 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 71
Gunnery Dive Rolling Right Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7240		7740		Gross weight(lb)	9030		9000	
4040		5490		Density altitude(ft)	5630		5030	
3.5		18.5		Air temperature(°C)	12.0		16.0	
323		323		Main rotor speed(rpm)	325		322	
125		126		Airspeed(KCAS)	120		125	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 50	± 150	- 50	± 75	T/R red pitch link F(lb)	+ 25 ± 150	- 50 ± 50		
+ 100	± 150	+ 25	± 100	T/R white pitch link F(lb)	+ 25 ± 125	- 50 ± 50		
- 175	± 150	- 100	± 100	T/R pitch cont tube axial F(lb)	- 75 ± 150	- 100 ± 75		
- 10,000	± 30,000	0	± 20,000	T/B vertical M ² (in-lb)	- 10,000 ± 15,000	0 ± 15,000		
+ 70,000	± 30,000	+ 95,000	± 35,000	T/B lateral M ² (in-lb)	+ 85,000 ± 15,000	+ 100,000 ± 25,000		
+ 1800	± 400	+ 2700	± 300	Upper left fitting stress ² (psi)	+ 3000 ± 200	+ 2200 ± 300		
- 17,000	± 8000	- 17,000	± 8000	T/F forward & aft M ³ (in-lb)	- 19,000 ± 5000	- 20,000 ± 4000		
+ 16,000	± 3000	+ 12,000	± 4000	T/F lateral M ³ (in-lb)	+ 22,000 ± 4000	+ 20,000 ± 3000		
+ 100	± 1000	+ 500	± 1000	T/R shaft parallel M(in-lb)	0 ± 900	+ 300 ± 1000		
- 200	± 1000	+ 300	± 1000	T/R shaft perp M(in-lb)	+ 200 ± 800	+ 200 ± 1300		
0	± 0.5	2.5 L	± 1.	T/R blade pitch (deg)	2.5 L ± 0.5	+ 5 L ± 0.5		
+ 10,000	± 8000	+ 10,000	± 10,000	T/B torque ² (in-lb)	+ 14,000 ± 6000	+ 12,000 ± 6000		
+ 60	±	+ 60	±	T/R shaft torque(ft-lb)	+ 50 ±	+ 70 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

Instrumentation located at tail fin station 41.0

FIGURE 72
Gunnery Dive Symmetrical Pull Out
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7360		7490		Gross weight(lb)	8690		9330	
3560		3690		Density altitude(ft)	4000		4480	
4.5		3.5		Air temperature(°C)	10.5		13.5	
332		330		Main rotor speed(rpm)	334		330	
136		142		Airspeed(KCAS)	126		131	
2.4		2.3		Normal acceleration(G's)	2.3		2.1	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	±200	-75	±50	T/R red pitch link F(lb)	-25	±100	-100	±50
+50	±200	-50	±50	T/R white pitch link F(lb)	+75	±125	-50	±75
-150	±175	-50	±50	T/R pitch cont tube axial F(lb)	-50	±150	-200	±50
-60,000	±20,000	-45,000	±25,000	T/B vertical M ² (in-lb)	-50,000	±45,000	-40,000	±35,000
+10,000	±20,000	+40,000	±15,000	T/B lateral M ² (in-lb)	+15,000	±30,000	+40,000	±35,000
+2500	±360	+1800	±400	Upper left fitting stress ² (psi)	+1700	±1000	+1600	±700
-18,000	±19,000	-17,000	±12,000	T/F forward & aft M ³ (in-lb)	-14,000	±19,000	-15,000	±13,000
+5000	±4000	+8000	±3000	T/F lateral M ³ (in-lb)	+7000	±6000	+11,000	±7000
0	±1400	+400	±1400	T/R shaft parallel M(in-lb)	+200	±1800	+500	±1700
-200	±1300	+300	±1500	T/R shaft perp M(in-lb)	+400	±1500	+400	±1700
0	±0.5	2.5 L	±0.5	T/R blade pitch (deg)	0.5 L	±0.5	3.5 L	±0.5
+8000	±10000	+8000	±8000	T/B torque ² (in-lb)	+6000	±10,000	+12,000	±12,000
70	±	65	±	T/R shaft torque(ft-lb)	90	±	75	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 73
Gunnery Dive Symmetrical Pull Out
AH-1G S/N 71-20985

CLIAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7290		7140		Gross weight(lb)	9050		9240	
2530		4030		Density altitude(ft)	4260		3770	
5.0		16.0		Air temperature(°C)	13.5		14.	
324		324		Main rotor speed(rpm)	332		330	
157		170		Airspeed(KCAS)	154		158	
2.0		1.9		Normal acceleration(G's)	2.3		2.2	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	± 150	-100	± 100	T/R red pitch link F(lb)	-50	± 100	-125	± 150
+ 75	± 150	-25	± 150	T/R white pitch link F(lb)	-50	± 100	-100	± 125
- 50	± 150	-10	± 100	T/R pitch cont tube axial F(lb)	0	± 100	-200	± 80
-35,000	±45,000	-35,000	±45,000	T/B vertical M ² (in-lb)	-20,000	±50,000	-30,000	±55,000
+95,000	±50,000	+105,000	±70,000	T/B lateral M ² (in-lb)	+100,000	±50,000	+115,000	±50,000
+2800	± 700	+2800	± 700	Upper left fitting stress ² (psi)	+3400	± 500	+3500	± 900
-19,000	±15,000	-10,000	±16,000	T/F forward & aft M ³ (in-lb)	-16,000	±16,500	-10,500	±13,500
+18,000	±6000	+15,000	±6000	T/F lateral M ³ (in-lb)	+22,000	± 7000	+10,000	± 8000
+ 100	±1500	+500	±1800	T/R shaft parallel M(in-lb)	+100	± 1500	+400	± 1400
0	±1500	+300	± 100	T/R shaft perp M(in-lb)	0	± 1500	+400	±2100
0	± 0.5	3.0 L	± 0.5	T/R blade pitch (deg)	0	± 0.5	5.0 L	± 0.5
+20,000	±10,000	+15,000	±20,000	T/B torque ² (in-lb)	+20,000	±12,000	+30,000	±20,000
70	±	55	±	T/R shaft torque(ft-lb)	95	±	90	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 74
Gunnery Dive Rolling Left Pull Out
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7340		7190		Gross weight(lb)	9140		9270	
2810		4090		Density altitude(ft)	4310		4150	
4		15		Air temperature(°C)	13		13	
329		330		Main rotor speed(rpm)	328		328	
142		149		Airspeed(KCAS)	126		133	
2.1		2.3		Normal acceleration(G's)	2.2		2.0	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-50	± 100	-125	± 50	T/R red pitch link F(lb)	-75 ± 125		-175	± 100
0	± 75	-50	± 50	T/R white pitch link F(lb)	-100 ± 75		-150	± 100
0	± 200	+100	± 75	T/R pitch cont tube axial F(lb)	+125 ± 100		+150	± 75
-60000	± 30000	-65000	± 30000	T/B vertical M ² (in-lb)	-40000 ± 30000		-45000	± 35000
+30000	± 30000	+5000	± 30000	T/B lateral M ² (in-lb)	+20000 ± 20000		+25000	± 35000
+1700	± 500	1900	± 500	Upper left fitting stress ² (psi)	+1800 ± 400		+2300	± 600
-14000	± 12000	-19000	± 12000	T/F forward & aft M ³ (in-lb)	-2300 ± 10000		-32000	± 12500
+8000	± 4000	+4000	± 3000	T/F lateral M ³ (in-lb)	+14000 ± 5000		+11000	± 8000
0	± 1400	+500	± 1600	T/R shaft parallel M(in-lb)	+200 ± 1000		+400	± 1400
-100	± 1200	+400	± 1600	T/R shaft perp M(in-lb)	0 ± 1000		+200	± 1700
1 L	± 0.5	4.5 L	± 0.5	T/R blade pitch (deg)	1.5 L ± 0.5		5 L	± 0.5
+10000	± 10000	+8000	± 8000	T/B torque ² (in-lb)	+6000 ± 14000		+12000	± 12000
+65	±	50	±	T/R shaft torque(ft-lb)	+115 ±		+105	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 75
Gunnery Dive Rolling Left Pull Out
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7260		7690		Gross weight(lb)	8990		8930	
2640		4790		Density altitude(ft)	3800		4200	
5		19		Air temperature(°C)	12		18.5	
325		321		Main rotor speed(rpm)	328		326	
150		181		Airspeed(KCAS)	159		157	
2.1		2.5		Normal acceleration(G's)	2		2.1	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	±200	-100	±75	T/R red pitch link F(lb)	-25	±225	-100	±75
0	±200	-25	±150	T/R white pitch link F(lb)	-25	±175	-75	±100
0	±175	0	±75	T/R pitch cont tube axial F(lb)	+150	±250	+150	±100
-40000	±50000	-20000	±50000	T/B vertical M ² (in-lb)	-25000	±45000	-18000	±32000
+90000	±40000	+95000	±80000	T/B lateral M ² (in-lb)	+85000	±50000	+95000	±46000
+3100	±700	+3100	±1200	Upper left fitting stress ² (psi)	2700	±800	+2900	±1000
-19000	±13000	-25500	±15000	T/F forward & aft M ³ (in-lb)	-23000	±15000	-28000	±16000
+22000	±7000	+18000	±8000	T/F lateral M ³ (in-lb)	+20000	±10000	+22000	±8000
+200	±1600	+500	±1700	T/R shaft parallel M(in-lb)	+100	±2000	+500	±2000
0	±1500	+300	±1800	T/R shaft perp M(in-lb)	0	±1500	+400	±2000
2.5L	±0.5	5L	±0.5	T/R blade pitch (deg)	2.5L	±0.5	7L	±0.5
+19000	±12000	+18000	±16000	T/B torque ² (in-lb)	+10000	±14000	+20000	±20000
+70	±	+85	±	T/R shaft torque(ft-lb)	+105	±	+120	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 76
Gunnery Dive Rolling Right Pull Out
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7350		7240		Gross weight(lb)	9200		9000	
2840		4000		Density altitude(ft)	4100		1670	
4		16.5		Air temperature(°C)	14		16.5	
332		336		Main rotor speed(rpm)	336		330	
139		130		Airspeed(KCAS)	115		127	
2.5		2.3		Normal acceleration(G's)	2.2		2.1	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
0	±125	-50	±50	T/R red pitch link F(lb)	+50 ±50		-50 ±75	
+25	±100	-25	±75	T/R white pitch link F(lb)	+25 ±50		-25 ±100	
-150	±150	-50	±100	T/R pitch cont tube axial F(lb)	-150 ±75		-125 ±75	
-60000	±25000	-55000	±25000	T/B vertical M ² (in-lb)	-30000 ±30000		-30000 ±45000	
+15000	±25000	+10000	±20000	T/B lateral M ² (in-lb)	+50000 ±30000		+82000 ±40000	
+1400	±500	+1500	±500	Upper left fitting stress ² (psi)	+1800 ±500		+2400 ±800	
-17000	±8000	-18000	±8500	T/F forward & aft M ³ (in-lb)	-15000 ±13500		-16000 ±14000	
+4000	±5000	+2000	±3000	T/F lateral M ³ (in-lb)	+3000 ±6000		15000 ±6000	
0	±1300	+400	±1700	T/R shaft parallel M(in-lb)	+200 ±1100		+500 ±1400	
+100	±1200	+300	±1600	T/R shaft perp M(in-lb)	±1000		+200 ±1800	
5R	±0.5	1L	±0.5	T/R blade pitch (deg)	5R ±0.5		3L ±0.5	
+8000	±10000	+8000	±6500	T/B torque ² (in-lb)	+4000 ±8000		+12000 ±12000	
+70	±	+50	±	T/R shaft torque(ft-lb)	+50 ±		+55 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 77
Gunnery Dive Rolling Right Pull Out
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7240		7740		Gross weight(lb)	9030		8950	
2370		4960		Density altitude(ft)	4360		4360	
5		18.5		Air temperature(°C)	13.5		17.5	
326		322		Main rotor speed(rpm)	330		327	
154		172		Airspeed(KCAS)	154		160	
2.1		2.1		Normal acceleration(G's)	2.1		2.1	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+25	±175	0	±75	T/R red pitch link F(lb)	0	±125	-75	±100
+50	±200	+25	±150	T/R white pitch link F(lb)	0	±100	-75	±150
	±	-50	±150	T/R pitch cont tube axial F(lb)	0	±100	-100	±100
-50000	±40000	-10000	±50000	T/B vertical M ² (in-lb)	-20000	±50000	-30000	±50000
+60000	±40000	+95000	±60000	T/B lateral M ² (in-lb)	+125000	±40000	+11000	±45000
+2400	±500	+2900	±800	Upper left fitting stress ² (psi)	+4200	±800	+3700	±1200
-18000	±13000	-22000	±16000	T/F forward & aft M ³ (in-lb)	-5000	±17000	-21000	±18000
+12000	±6000	+16000	±7000	T/F lateral M ³ (in-lb)	+25000	±5000	+27000	±9000
+300	±1500	+600	±2000	T/R shaft parallel M(in-lb)	+100	±1500	+300	±2100
0	±1500	+400	±2000	T/R shaft perp M(in-lb)	0	±1300	+400	±2400
0	±0.5	2.1	±0.5	T/R blade pitch (deg)	0.6	±0.5	5.1	±0.5
16000	±12000	+18000	±18000	T/B torque ² (in-lb)	24000	±12000	26000	±16500
+75	±	+75	±	T/R shaft torque(ft-lb)	+80	±	+90	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 78
Spray Fire Gunnery Dive
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7320		7100		Gross weight(lb)	9120		9210	
3230		4850		Density altitude(ft)	4400		4550	
5		16		Air temperature(°C)	13		13	
321		322		Main rotor speed(rpm)	324		325	
114		112		Airspeed(KCAS)	107		104	
± 20		± 16		Sideslip angle(deg)	± 16		± 17	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+175	± 250	+175	± 125	T/R red pitch link F(lb)	+300 ± 250		+225	± 125
+225	± 200	+250	± 125	T/R white pitch link F(lb)	+150 ± 150		+250	± 150
-300	± 210	-250	± 125	T/R pitch cont tube axial F(lb)	-400 ± 225		-325	± 125
+30000	± 30000	+10000	± 20000	T/B vertical M ² (in-lb)	+31000 ± 15000		+25000	± 20000
+170000	± 20000	+130000	± 15000	T/B lateral M ² (in-lb)	150100 ± 15000		+125000	± 20000
+3100	± 400	+2100	± 200	Upper left fitting stress ² (psi)	+3000 ± 300		+2400	± 400
-20000	± 7000	-19000	± 6500	T/F forward & aft M ³ (in-lb)	-17500 ± 6500		-19000	± 7000
+32000	± 3000	+19000	± 2000	T/F lateral M ³ (in-lb)	+21000 ± 4000		+11000	± 5000
+100	± 1100	+500	± 1400	T/R shaft parallel M(in-lb)	+200 ± 900		+500	± 1400
-100	± 100	-100	± 1400	T/R shaft perp M(in-lb)	0 ± 1000		+100	± 1400
4.2	± 0.5	8.2	± 0.5	T/R blade pitch (deg)	5.2 ± 0.5		8.0	± 0.5
+42000	± 8000	+20000	± 6000	T/B torque ² (in-lb)	+18000 ± 6000		+20000	± 6000
+90	±	+15	±	T/R shaft torque(ft-lb)	+140 ±		+45	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 79
Spray Fire Gunnery Dive
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7500		7290		Gross weight(lb)	8960		9180	
3100		4130		Density altitude(ft)	4150		4470	
11.5		17.0		Air temperature(°C)	12.5		17.5	
322		323		Main rotor speed(rpm)	324		323	
176		175		Airspeed(KCAS)	152		157	
± 8		± 7		Sideslip angle(deg)	± 11		± 8	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+ 75	± 250	+25	± 475	T/R red pitch link F(lb)	+200	± 250	+125	± 175
+100	± 425		±	T/R white pitch link F(lb)	+100	± 150	+100	± 175
-25	± 250	-150	± 200	T/R pitch cont tube axial F(lb)	-400	± 300	-250	± 200
+20000	± 35000	+23000	± 55000	T/B vertical M ² (in-lb)	+15000	± 25000	+25000	± 35000
+160000	± 30000	+150000	± 50000	T/B lateral M ² (in-lb)	+100000	± 25000	+180000	± 25000
+3400	± 300	+3250	± 500	Upper left fitting stress ² (psi)	+3300	± 300	+1700	± 500
-24000	± 10000	-21000	± 12500	T/F forward & aft M ³ (in-lb)	-20000	± 7000	-23000	± 7000
+26000	± 4000	+24000	± 6000	T/F lateral M ³ (in-lb)	+18000	± 5000	+36000	± 6000
+100	± 1500	+400	± 1600	T/R shaft parallel M(in-lb)	+200	± 900	+500	± 1800
0	± 1100	0	± 1100	T/R shaft perp M(in-lb)	0	± 1100	+100	± 1600
2.5L	± 0.5	0.5L	± 0.5	T/R blade pitch (deg)	3.5L	± 0.5	0.5L	± 0.5
+28000	± 8000	+39000	± 2000	T/B torque ² (in-lb)	+1600	± 4000	+40000	± 12000
+95	±	+40	±	T/R shaft torque(ft-lb)	+85	±	+85	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 80
Evasive S-Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
		7460		Gross weight (lb)			8960	
		3880		Density altitude (ft)			4060	
		4.0		Air temperature (°C)			12.0	
		322		Main rotor speed (rpm)			324	
		111		Airspeed (KCAS)			105	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
±		0	± 25	T/R red pitch link F(lb)	±		-50	± 50
±		0	± 25	T/R white pitch link F(lb)	±		-25	± 50
±		-75	± 25	T/R pitch cont tube axial F(lb)	±		-125	± 50
±		-15,000	± 15,000	T/B vertical M ² (in-lb)	±		-10,000	± 20,000
±		+75,000	± 15,000	T/B lateral M ² (in-lb)	±		+110,000	± 20,000
±		+1400	± 300	Upper left fitting stress ² (psi)	±		+1600	± 400
±		-25,000	± 5000	T/F forward & aft M ³ (in-lb)	±		-25,000	± 6000
±		+15,000	± 2000	T/F lateral M ³ (in-lb)	±		+20,000	± 3000
±		+400	± 600	T/R shaft parallel M (in-lb)	±		+200	± 900
±		0	± 700	T/R shaft perp M (in-lb)	±		+300	± 1100
±		4. L	± 0.5	T/R blade pitch (deg)	±		1. L	± 1.
±		+20,000	± 6000	T/B torque ² (in-lb)	±		+16,000	± 8000
±		+55	±	T/R shaft torque (ft-lb)	±		+45	±

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 81
Evasive S-Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
7480		7710		Gross weight(lb)	9290		9130	
4070		4030		Density altitude(ft)	3900		4010	
12.5		19.0		Air temperature(°C)	13.0		14.0	
320		315		Main rotor speed(rpm)	318		322	
146		150		Airspeed(KCAS)	134		129	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-25	± 250	-175	± 125	T/R red pitch link F(lb)	-50 ± 150		-75 ± 75	
-75	± 250	-100	± 150	T/R white pitch link F(lb)	-50 ± 100		-50 ± 100	
-175	± 150	-100	± 125	T/R pitch cont tube axial F(lb)	-100 ± 125		-200 ± 100	
-20,000	± 20,000	-5000	± 35,000	T/B vertical M ² (in-lb)	-20,000 ± 20,000		-10,000 ± 20,000	
+125,000	± 30,000	+115,000	± 30,000	T/B lateral M ² (in-lb)	+120,000 ± 30,000		+135,000 ± 30,000	
+3300	± 400	+3700	± 900	Upper left fitting stress ² (psi)	+3400 ± 300		+3500 ± 700	
-25,500	± 5000	-27,000	± 10,000	T/F forward & aft M ³ (in-lb)	-21,500 ± 8000		-22,500 ± 7500	
+25,000	± 4000	+24,000	± 7000	T/F lateral M ³ (in-lb)	+26,000 ± 4000		+27,000 ± 5000	
+200	± 1000	+400	± 1600	T/R shaft parallel M(in-lb)	+200 ± 900		+300 ± 1300	
+200	± 800	+100	± 2000	T/R shaft perp M(in-lb)	+200 ± 800		+400 ± 1500	
+4.5 L	± 0.5	7. L	± 1.	T/R blade pitch (deg)	6.5 L ± 0.5		5. L ± 1.	
+24,000	± 4000	+26,000	± 14,000	T/B torque ² (in-lb)	+26,000 ± 8000		+28,000 ± 12,000	
+90	±	+100	±	T/R shaft torque(ft-lb)	+140 ±		+60 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 82
Autorotational Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7620		Gross weight(lb)			9360		
		5480		Density altitude(ft)			4780		
		14.5		Air temperature(°C)			11.5		
		324		Main rotor speed(rpm)			327		
		99		Airspeed (KCAS)			93		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	0	± 25		T/R red pitch link F(lb)	±	0	± 25		
±	0	± 25		T/R white pitch link F(lb)	±	+ 25	± 25		
±	-125	± 75		T/R pitch cont tube axial F(lb)	±	- 75	± 25		
±	+5000	± 2000		T/B vertical M ² (in-lb)	±	+15,000	± 10,000		
±	-25,000	± 5000		T/B lateral M ² (in-lb)	±	+15,000	± 10,000		
±	+700	± 400		Upper left fitting stress ² (psi)	±	+900	± 200		
±	-27,500	± 5500		T/F forward & aft M ³ (in-lb)	±	-21,000	± 5000		
±	+1000	± 2000		T/F lateral M ³ (in-lb)	±	-5000	± 2000		
±	+200	± 900		T/R shaft parallel M(in-lb)	±	+400	± 600		
±	+200	± 1000		T/R shaft perp M(in-lb)	±	+500	± 700		
±	1.4	± 0.5		T/R blade pitch (deg)	±	+1.5R	± 0.5		
±	0	± 6000		T/B torque ² (in-lb)	±	0	± 8000		
±		±		T/R shaft torque(ft-lb)	±	+25	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 83
Autorotational Entry
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
7560		7360		Gross weight (lb)		9330		9260	
5050		5220		Density altitude (ft)		4610		5180	
5.0		17.5		Air temperature (°C)		9.0		15.5	
328		323		Main rotor speed (rpm)		330		324	
127		124		Airspeed (KCAS)		122		116	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
+100 ± 100		0 ± 100		T/R red pitch link F(lb)		+50 ± 100		0 ± 50	
+100 ± 125		±		T/R white pitch link F(lb)		+150 ± 125		+25 ± 50	
-125 ± 125		-75 ± 75		T/R pitch cont tube axial F(lb)		-150 ± 125		-100 ± 75	
+5000 ± 20000		+15000 ± 45000		T/B vertical M ² (in-lb)		+5000 ± 20000		+20000 ± 15000	
+35000 ± 10000		+45000 ± 40000		T/B lateral M ² (in-lb)		+20000 ± 10000		+30000 ± 10000	
+400 ± 500		-300 ± 600		Upper left fitting stress ² (psi)		+500 ± 600		0 ± 400	
-16000 ± 8000		-16000 ± 6000		T/F forward & aft M ³ (in-lb)		-13500 ± 7000		-12000 ± 6000	
0 ± 2000		-3000 ± 3000		T/F lateral M ³ (in-lb)		0 ± 4000		-5000 ± 2000	
0 ± 900		+400 ± 1200		T/R shaft parallel M (in-lb)		0 ± 900		+300 ± 1000	
+200 ± 900		+200 ± 800		T/R shaft perp M (in-lb)		+400 ± 1700		+400 ± 1100	
3.0 R ± 0.5		1.0 R ± 0.5		T/R blade pitch (deg)		2.0 L ± 0.5		1.5 R ± 0.5	
-2000 ± 10000		0 ± 10000		T/B torque ² (in-lb)		+2000 ± 8000		-6000 ± 8000	
+40 ± 40		+40 ± 25		T/R shaft torque (ft-lb)		+40 ± 40		+40 ± 40	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 84
Stabilized Autorotation
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7620		Gross weight(lb)			9360		
		5000		Density altitude(ft)			3310		
		15		Air temperature(°C)			11		
		323		Main rotor speed(rpm)			324		
		72		Airspeed(KCAS)			70		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±		+50	± 50	T/R red pitch link F(lb)	±		+25	±25	
±		+50	±75	T/R white pitch link F(lb)	±		0	± 25	
±		-100	± 75	T/R pitch cont tube axial F(lb)	±		-100	± 25	
±		-5000	±20000	T/B vertical M ² (in-lb)	±		-5000	±10000	
±		-5000	± 5000	T/B lateral M ² (in-lb)	±		-5000	±10000	
±		-100	± 600	Upper left fitting stress ² (psi)	±		+100	± 300	
±		-22500	± 5000	T/F forward & aft M ³ (in-lb)	±		-15000	± 4000	
±		-4000	± 4000	T/F lateral M ³ (in-lb)	±		-4000	±2000	
±		0	±800	T/R shaft parallel M(in-lb)	±		+400	± 700	
±		+100	± 1100	T/R shaft perp M(in-lb)	±		+400	± 700	
±		12	±	T/R blade pitch (deg)	±		0.52	±	
±		0	± 7000	T/B torque ² (in-lb)	±		0	± 7000	
±		+46	±	T/R shaft torque(ft-lb)	±		+45	±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 85
Stabilized Autorotation
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION			
801	212	FLIGHT PARAMETER ¹		801	212		
7560	7360	Gross weight(lb)		9330	9260		
4580	4870	Density altitude(ft)		3430	4420		
7	18	Air temperature(°C)		10	16		
314	315	Main rotor speed(rpm)		323	326		
121	116	Airspeed(KCAS)		122	118		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC
+100 ± 175	0 ± 100	T/R red pitch link F(lb)		+50 ± 125	0 ± 50		
+100 ± 150	±	T/R white pitch link F(lb)		+75 ± 150	25 ± 50		
-125 ± 150	-50 ± 50	T/R pitch cont tube axial F(lb)		-150 ± 125	-75 ± 75		
-15000 ± 25000	-5000 ± 20000	T/B vertical M ² (in-lb)		-20000 ± 20000	-10000 ± 20000		
-5000 ± 15000	0 ± 20000	T/B lateral M ² (in-lb)		-10000 ± 20000	-10000 ± 15000		
-100 ± 500	0 ± 500	Upper left fitting stress ² (psi)		-100 ± 600	+100 ± 400		
-13000 ± 7000	-14000 ± 6000	T/F forward & aft M ³ (in-lb)		-8000 ± 6000	-10000 ± 6000		
-3000 ± 3000	-3000 ± 3000	T/F lateral M ³ (in-lb)		-5000 ± 3000	-6000 ± 3000		
0 ± 900	+300 ± 1000	T/R shaft parallel M(in-lb)		0 ± 1000	+300 ± 1000		
200 ± 1000	+300 ± 1000	T/R shaft perp M(in-lb)		+300 ± 1700	+200 ± 900		
5R ± 0.5	2R ± 0.5	T/R blade pitch (deg)		4.0R ± 0.5	1R ± 0.5		
-6000 ± 8000	-2000 ± 8000	T/B torque ² (in-lb)		-2000 ± 8000	-6000 ± 6000		
+40 ±	+40 ±	T/R shaft torque(ft-lb)		+35 ±	+40 ±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 86
Autorotational Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION			
801		212		FLIGHT PARAMETER ¹	801		212	
		7560		Gross weight(lb)			9320	
		3960		Density altitude(ft)			3580	
		15.5		Air temperature(°C)			11.5	
		321		Main rotor speed(rpm)			321	
		70		Airspeed(KCAS)			70	
		24.4		Bank angle(deg)			28.4	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
±		0	± 25	T/R red pitch link F(lb)	±	-50	± 25	
±		0	± 25	T/R white pitch link F(lb)	±	-25	± 25	
±		-100	± 50	T/R pitch cont tube axial F(lb)	±	-75	± 25	
±		-10000	± 15000	T/B vertical M ² (in-lb)	±	-20000	± 15000	
±		-5000	± 10000	T/B lateral M ² (in-lb)	±	-5000	± 10000	
±		+100	± 400	Upper left fitting stress ² (psi)	±	+300	± 400	
±		-19500	± 5000	T/F forward & aft M ³ (in-lb)	±	-19000	± 5000	
±		-3000	± 2000	T/F lateral M ³ (in-lb)	±	-3000	± 2000	
±		+100	± 800	T/R shaft parallel M(in-lb)	±	+400	± 700	
±		+100	± 700	T/R shaft perp M(in-lb)	±	+400	± 700	
±		0	± 0.5	T/R blade pitch (deg)	±	1.5	± 0.5	
±		-2000	± 6000	T/B torque ² (in-lb)	±	-6000	± 6000	
±		+45	±	T/R shaft torque(ft-lb)	±	+45	±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 87
Autorotational Left Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7560		7360		Gross weight(lb)	9290		9220		
3890		3870		Density altitude(ft)	3520		4130		
7.5		17		Air temperature(°C)	10.0		16		
330		330		Main rotor speed(rpm)	319		320		
118		125		Airspeed(KCAS)	121		120		
30L		31L		Bank angle(deg)	28L		30L		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
+75	±125	0	±100	T/R red pitch link F(lb)	+75 ±125	-25 ±50			
+100	±150			T/R white pitch link F(lb)	+100 ±125	0 ±50			
-100	±150	0	±50	T/R pitch cont tube axial F(lb)	-150 ±175	-50 ±50			
-15000	±20000	-30000	±30000	T/B vertical M ² (in-lb)	-15000 ±15000	-25000 ±20000			
-5000	±15000	-5000	±25000	T/B lateral M ² (in-lb)	-10000 ±10000	20000 ±15000			
+200	±400	+400	±600	Upper left fitting stress ² (psi)	+200 ±400	+200 ±500			
-11000	±7000	-12000	±7500	T/F forward & aft M ³ (in-lb)	-10000 ±6000	-10000 ±6000			
-5000	±2000	-3000	±2000	T/F lateral M ³ (in-lb)	-4000 ±4000	-6000 ±2000			
0	±900	+400	±1100	T/R shaft parallel M(in-lb)	200 ±1000	+200 ±900			
+200	±1000	+200	±1100	T/R shaft perp M(in-lb)	+200 ±1500	+200 ±900			
4.5R	±0.5	1.5R	±0.5	T/R blade pitch (deg)	4.0R ±0.5	0.5L ±0.5			
-6000	±10000	-2000	±10000	T/B torque ² (in-lb)	-2000 ±8000	-400 ±6000			
+50	±	+50	±	T/R shaft torque(ft-lb)	+40 ±	+40 ±			

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 88
Autorotational Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7510		Gross weight(lb)			9300		
		3950		Density altitude(ft)			3430		
		16.0		Air temperature(°C)			11.0		
		323		Main rotor speed(rpm)			324		
		71		Airspeed(KCAS)			72		
		21 R		Bank angle(deg)			19 R		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	+25	±50		T/R red pitch link F(lb)	±	+25	±25		
±	+30	±50		T/R white pitch link F(lb)	±	0	±25		
±	-100	±50		T/R pitch cont tube axial F(lb)	±	-100	±50		
±	-15000	±15000		T/B vertical M ² (in-lb)	±	-15000	±15000		
±	0	±5000		T/B lateral M ² (in-lb)	±	-5000	±15000		
±	+100	±400		Upper left fitting stress ² (psi)	±	+400	±300		
±	-21000	±5500		T/F forward & aft M ³ (in-lb)	±	-14000	±5000		
±	-3000	±3000		T/F lateral M ³ (in-lb)	±	-4000	±2000		
±	+200	±1100		T/R shaft parallel M(in-lb)	±	+400	±1000		
±	+300	±900		T/R shaft perp M(in-lb)	±	+500	±800		
±	1 R	±0.5		T/R blade pitch (deg)	±	0.5 R	±0.5		
±	+2000	±6000		T/B torque ² (in-lb)	±	+6000	±6000		
±	+50	±		T/R shaft torque(ft-lb)	±	+55	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 89
Autorotational Right Turn
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801	212		
1560		7330		Gross weight(lb)	9120	9200		
2900		4250		Density altitude(ft)	3170	4240		
8.0		17.0		Air temperature(°C)	10.0	16.5		
322		325		Main rotor speed(rpm)	326	320		
123		118		Airspeed(KCAS)	113	115		
30 R		26 R		Bank angle(deg)	30 R	27 R		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+100 ± 150		+25 ± 75		T/R red pitch link F(lb)	+150 ± 150		+50 ± 50	
+100 ± 125		±		T/R white pitch link F(lb)	+100 ± 150		+75 ± 100	
-125 ± 125		-125 ± 100		T/R pitch cont tube axial F(lb)	-125 ± 150		-100 ± 100	
-15000 ± 20000		-10000 ± 15000		T/B vertical M ² (in-lb)	-20000 ± 15000		-10000 ± 20000	
0 ± 15000		0 ± 15000		T/B lateral M ² (in-lb)	+5000 ± 15000		0 ± 15000	
0 ± 600		+200 ± 500		Upper left fitting stress ² (psi)	-300 ± 400		-200 ± 400	
-9000 ± 8000		-13000 ± 6000		T/F forward & aft M ³ (in-lb)	-8000 ± 7000		-10000 ± 5000	
-4000 ± 3000		-4000 ± 3000		T/F lateral M ³ (in-lb)	-3000 ± 4000		-3000 ± 3000	
0 ± 1000		+200 ± 1200		T/R shaft parallel M(in-lb)	+100 ± 1000		+300 ± 1100	
+200 ± 900		-180 ± 1200		T/R shaft perp M(in-lb)	+300 ± 2000		+200 ± 1300	
+2 ± 0.5		2.5 R ± 0.5		T/R blade pitch (deg)	1 R ± 0.5		1.5 R ± 0.5	
-2000 ± 8000		-2000 ± 12000		T/B torque ² (in-lb)	-1000 ± 6000		-1000 ± 6000	
50 ±		+55 ±		T/R shaft torque(ft-lb)	+60 ±		+50 ±	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 90
Autorotational Power Recovery
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7620		Gross weight(lb)			9360		
		3820		Density altitude(ft)			2990		
		15.5		Air temperature(°C)			10.5		
		324		Main rotor speed(rpm)			326		
		70		Airspeed(KCAS)			67		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	-25	± 25		T/R red pitch link F(lb)	±	-50	± 25		
±	0	± 25		T/R white pitch link F(lb)	±	-25	± 25		
±	-75	± 50		T/R pitch cont tube axial F(lb)	±	-15	± 25		
±	-10000	± 15000		T/B vertical M ² (in-lb)	±	-10000	± 10000		
±	+8000	± 5000		T/B lateral M ² (in-lb)	±	+35000	± 10000		
±	+800	± 400		Upper left fitting stress ² (psi)	±	+1100	± 400		
±	-20000	± 5500		T/F forward & aft M ³ (in-lb)	±	-16000	± 5000		
±	+7000	± 2000		T/F lateral M ³ (in-lb)	±	+3000	± 2000		
±	+300	± 900		T/R shaft parallel M(in-lb)	±	+400	± 800		
±	+200	± 1000		T/R shaft perp M(in-lb)	±	+700	± 700		
±	0.5 L	± 0.5		T/R blade pitch (deg)	±	1.5 L	± 0.5		
±	+6000	± 6000		T/B torque ² (in-lb)	±	+6000	± 8000		
±	+90	± 60		T/R shaft torque(ft-lb)	±	+45	±		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 91
Autorotational Power Recovery
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION			
801		212		801		212	
7560		7360		9250		9220	
2370		3740		2600		4120	
7.5		16.5		9.5		17	
325		327		325		324	
118		123		114		123	
MEAN		OSC		MEAN		OSC	
-76		±100		0		±100	
-125		±100		0		±100	
-100		±125		-250		±125	
-15000		±30000		-30000		±20000	
+50000		±10000		+55000		±35000	
+1000		±600		+2200		±300	
-12500		±8000		-12000		±8000	
+2000		±3000		+2000		±4000	
0		±1000		+200		±1000	
+200		±1000		0		±1100	
3.0R		±0.5		0		±0.5	
+4000		±9000		+6000		±10000	
+20		±40		+55		±75	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 92
Level Flight Throttle Chop
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801	212				801	212		
7330	7790			Gross weight(lb)	9080	9190		
4540	4000			Density altitude(ft)	4120	3980		
7	18			Air temperature(°C)	10	15		
302	319			Main rotor speed(rpm)	313	310		
73	68			Airspeed(KCAS)	71	70		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+50	±50	+25	±25	T/R red pitch link F(lb)	+50 ± 50	+25 ± 25		
+100	±50	+50	±25	T/R white pitch link F(lb)	+15 ± 50	+25 ± 25		
-50	±50	-150	±50	T/R pitch cont tube axial F(lb)	-100 ± 75	-150 ± 25		
-5000	±15000	0	±20000	T/B vertical M ² (in-lb)	+5000 ± 30000	+5000 ± 10000		
-15000	±10000	-5000	±10000	T/B lateral M ² (in-lb)	-5000 ± 15000	-10000 ± 15000		
-400	±500	-300	±500	Upper left fitting stress ² (psi)	0 ± 400	-400 ± 500		
-24000	±5000	-26000	±5000	T/F forward & aft M ³ (in-lb)	-20000 ± 5000	-19000 ± 4000		
-6000	±2000	-6000	±3000	T/F lateral M ³ (in-lb)	-2000 ± 2000	-4000 ± 1000		
+100	±700	+400	±700	T/R shaft parallel M(in-lb)	0 ± 700	+300 ± 800		
+200	±600	0	±800	T/R shaft perp M(in-lb)	+300 ± 1400	+100 ± 600		
2.5R	± 0.5	0	± 0.5	T/R blade pitch (deg)	1.4 ± 0.5	0 ± 0.5		
-2000	±8000	0	±5000	T/B torque ² (in-lb)	0 ± 6000	0 ± 6000		
0	±100	0	±150	T/R shaft torque(ft-lb)	+5 ± 220	+5 ± 180		

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 93
Climb Throttle Chop
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7590		7400		Gross weight(lb)	8920		9310	
4050		5200		Density altitude(ft)	4920		4100	
12		18		Air temperature(°C)	13		16	
323		322		Main rotor speed(rpm)	323		322	
70		71		Airspeed(KCAS)	72		71	
1200		1000		Rate of climb(fpm)	900		1000	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
+100	± 50	-50	± 50	T/R red pitch link F(lb)	+50	± 25	-25	± 25
+25	± 50		±	T/R white pitch link F(lb)	0	± 25	-25	± 25
-150	± 50	-75	± 50	T/R pitch cont tube axial F(lb)	-150	± 50	-50	± 50
+20000	± 20000	+10000	± 20000	T/B vertical M ² (in-lb)	+10000	± 20000	+15000	± 20000
-10000	± 10000	0	± 15000	T/B lateral M ² (in-lb)	-15000	± 10000	-5000	± 15000
-400	± 500	-500	± 600	Upper left fitting stress ² (psi)	0	± 400	+600	± 400
-14500	± 4000	-12500	± 4000	T/F forward & aft M ³ (in-lb)	-12500	± 1000	-19000	± 4000
-3000	± 1000	-1000	± 1000	T/F lateral M ³ (in-lb)	-4000	± 2000	-1000	± 1000
+100	± 600	+300	± 600	T/R shaft parallel M(in-lb)	0	± 500	+300	± 600
+300	± 700	+300	± 500	T/R shaft perp M(in-lb)	0	± 500	+400	± 600
2.5R	± 0.5	1.5L	± 0.5	T/R blade pitch (deg)	3.5R	± 0.5	2.5L	± 0.5
0	± 6000	-2000	± 8000	T/B torque ² (in-lb)	-600	± 4000	0	± 6000
+15	± 250	+10	± 70	T/R shaft torque(ft-lb)	+15	± 250	+10	± 200

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 94
Climb Throttle Chop
AH-1G S/N 71-20985

CLEAN CONFIGURATION				HOG CONFIGURATION					
801		212		FLIGHT PARAMETER ¹		801		212	
7580		7310		Gross weight(lb)		8890		9290	
4970		4640		Density altitude(ft)		5120		4630	
12.0		17.5		Air temperature(°C)		13.5		15.5	
323		321		Main rotor speed(rpm)		316		322	
70		73		Airspeed(KCAS)		70		71	
2400		2000		Rate of climb(fpm)		1400		1400	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER		MEAN	OSC	MEAN	OSC
+75 ± 75		-25 ± 25		T/R red pitch link F(lb)		+50 ± 25		0 ± 25	
0 ± 100		±		T/R white pitch link F(lb)		0 ± 25		0 ± 25	
-150 ± 50		-50 ± 25		T/R pitch cont tube axial F(lb)		-150 ± 25		-75 ± 50	
+10000 ± 15000		+15000 ± 20000		T/B vertical M ² (in-lb)		-10000 ± 25000		25000 ± 20000	
-5000 ± 10000		0 ± 15000		T/B lateral M ² (in-lb)		0 ± 15000		-5000 ± 15000	
-900 ± 300		-500 ± 400		Upper left fitting stress ² (psi)		0 ± 500		+100 ± 500	
-13000 ± 4500		-18000 ± 5000		T/F forward & aft M ³ (in-lb)		-15000 ± 3500		-19000 ± 4000	
-4000 ± 1500		-1000 ± 1000		T/F lateral M ³ (in-lb)		-5000 ± 2000		-5000 ± 2000	
0 ± 600		+300 ± 700		T/R shaft parallel M(in-lb)		0 ± 600		+300 ± 500	
+300 ± 800		+200 ± 700		T/R shaft perp M(in-lb)		+200 ± 600		+300 ± 700	
1R ± 0.5		0.5L ± 0.5		T/R blade pitch (deg)		2R ± 0.5		0 ± 0.5	
0 ± 4000		0 ± 8000		T/B torque ² (in-lb)		-2000 ± 6000		-2000 ± 6000	
+20 ± 300		+10 ± 100		T/R shaft torque(ft-lb)		+60 ±		+10 ± 200	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 95
Autorotational IGE Hover Power Recovery
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
		7430		Gross weight(lb)	8940		8970		
		3870		Density altitude(ft)	2840		2910		
		20.0		Air temperature(°C)	13.5		16.0		
		312		Main rotor speed(rpm)	319		324		
		104 to HVR		Airspeed(KCAS)	106 to HVR		105 to HVR		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
±	+25	±50		T/R red pitch link F(lb)	+75	±75	0	±25	
±	+50	±50		T/R white pitch link F(lb)	+125	±100	0	±50	
±	-100	±75		T/R pitch cont tube axial F(lb)	-100	±100	-75	±75	
±	0	±20000		T/B vertical M ² (in-lb)	+10000	±5000	+10000	±20000	
±	+50000	±15000		T/B lateral M ² (in-lb)	+100000	±5000	+100000	±25000	
±	+1200	±700		Upper left fitting stress ² (psi)	+1700	±500	+1900	±200	
±	-21000	±6000		T/F forward & aft M ³ (in-lb)	-24000	±2500	-3000	±5000	
±	+9000	±3000		T/F lateral M ³ (in-lb)	+24000	±2000	+10000	±1000	
±	+300	±1600		T/R shaft parallel M(in-lb)	0	±600	0	±1000	
±	+400	±1100		T/R shaft perp M(in-lb)	+500	±500	+700	±900	
±	7L	±0.5		T/R blade pitch (deg)	11.5L	±0.5	6L	±0.5	
±	+16000	±10000		T/B torque ² (in-lb)	+30000	±4000	+28000	±8000	
±	+40	±225		T/R shaft torque(ft-lb)	+10	±1800	+20	±140	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 96
Two-Foot Hover Autorotational Landing
AH-1G S/N 71-20985

CLEAN CONFIGURATION				FLIGHT PARAMETER ¹	HOG CONFIGURATION			
801		212			801		212	
7710		7480		Gross weight(lb)	9270		9070	
1700		3870		Density altitude(ft)	2860		2580	
5.5		21.0		Air temperature(°C)	14.0		14.0	
<250		<250		Main rotor speed(rpm)	<250		<250	
HVR		HVR		Airspeed(KCAS)	HVR		HVR	
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC
-50	± 50	-25	± 25	T/R red pitch link F(lb)	-25	± 25	-50	± 25
-50	± 50	-50	± 25	T/R white pitch link F(lb)	0	± 50	-25	± 25
		0	± 50	T/R pitch cont tube axial F(lb)	-50	± 50	-25	± 50
-15000	±20000	-10000	±30000	T/B vertical M ² (in-lb)	-20000	±35000	-15000	±55000
+5000	±25000	+15000	±30000	T/B lateral M ² (in-lb)	+5000	±5000	+25000	±50000
+300	±900	+700	±1100	Upper left fitting stress ² (psi)	+700	±1000	+1100	±1000
0	±4000	-8000	±4000	T/F forward & aft M ³ (in-lb)	-2000	±5000	-1000	±5000
+3000	±3000	+4000	±5000	T/F lateral M ³ (in-lb)	+2000	±6000	+4000	±7000
+100	±500	+200	±800	T/R shaft parallel M(in-lb)	-300	±500	-200	±700
-600	±500	+300	±800	T/R shaft perp M(in-lb)	+400	±600	+700	±800
.5L	± 0.5	.6L	± 0.5	T/R blade pitch (deg)	.2L	± 0.5	.7L	± 0.5
+8000	±8000	+10000	±10000	T/B torque ² (in-lb)	+10000	±6000	+20000	±8000
+30	±150	25	±125	T/R shaft torque(ft-lb)	+30	±255	80	±150

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 97
Autorotational Landing
AH-1G S/N 71-20985

CLEAN CONFIGURATION					HOG CONFIGURATION				
801		212		FLIGHT PARAMETER ¹	801		212		
7700		7360		Gross weight(lb)	8940		8940		
2490		3880		Density altitude(ft)	2000		2860		
11.5		21.5		Air temperature(°C)	8.0		15.5		
<250		255		Main rotor speed(rpm)	<250		<250		
106 to TD		105 to TD		Airspeed(KCAS)	106 to TD		104 to TD		
MEAN	OSC	MEAN	OSC	LOAD PARAMETER	MEAN	OSC	MEAN	OSC	
+25	±50	+25	±25	T/R red pitch link F(lb)	0	±50	0	±25	
+50	±50	+25	±25	T/R white pitch link F(lb)	0	±100	0	±50	
-50	±50	-100	±50	T/R pitch cont tube axial F(lb)	-50	±50	-100	±50	
-10000	±100000	+5000	±60000	T/B vertical M ² (in-lb)	+5000	±90000	-30000	±85000	
+35000	±25000	+10000	±55000	T/B lateral M ² (in-lb)	+40000	±80000	+95000	±88000	
+600	±2300	+100	±1400	Upper left fitting stress ² (psi)	+400	±2000	+2400	±800	
-17000	±11000	-15000	±13000	T/F forward & aft M ³ (in-lb)	-12500	±12500	-13000	±10000	
+5000	±9000	-1000	±1000	T/F lateral M ³ (in-lb)	+5000	±6000	-3000	±2000	
+100	±800	+400	±1400	T/R shaft parallel M(in-lb)	+100	±1200	+300	±900	
+500	±900	+400	±1100	T/R shaft perp M(in-lb)	+100	±1100	+300	±1200	
6.5L	±0.5	4.5L	±0.5	T/R blade pitch (deg)	4.5L	±0.5	3.0L	±0.5	
+10000	±8000	+8000	±12000	T/B torque ² (in-lb)	+8000	±12000	+6000	±6000	
+20	±100	0	±100	T/R shaft torque(ft-lb)	+40	±125	0	±50	

¹Average longitudinal CG at fuselage station 195.7

²Instrumentation located at tail boom station 50.0

³Instrumentation located at tail fin station 41.0

FIGURE 9B

TRACTOR TAIL ROTOR HORSEPOWER AVAILABLE
AH-1G USA S/N 71-20985

- NOTES: 1) DATA WAS OBTAINED DURING GROUND
RUN TIE-DOWN TESTS
2) RPM = 324
3) TAIL ROTOR BLADE ANGLE RANGE
801 , 10.2 RT \rightarrow 19.1 LT
212 , 10.3 RT \rightarrow 17.7 LT

